

A serene landscape photograph of a river at sunset. The sun is low on the right side, casting a warm, golden glow across the water and the sky. A dense forest of evergreen trees lines the far bank. In the foreground, there are large, green, pointed leaves, possibly of a water lily or similar aquatic plant, which are slightly out of focus compared to the background.

Foreword by **David Bellamy**

Hidden Nature

The Startling Insights of Viktor Schauberger

Alick Bartholomew



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Foreword

Water is the commonest substance on the face of the Earth, yet we really know very little about this essential source of life. We do know that without it there would be no life — indeed there would be little in the way of chemical reaction, for water is the universal catalyst. Water is also our potential nemesis, for today it is widely agreed that if there is another world war, it will be waged over this precious resource. Water in a state fit enough for human consumption or for succouring the life cycle of the brown trout is now in short supply and its availability is diminishing every day.

Before Austria had stripped her mountains of all her old growth forests, Viktor Schauburger, a forester, observing how a trout could maintain its station in the midst of a turbulent stream, discovered the secret of living water. Distilled from the sea and leaving most of its burden of salt behind, it droppeth as the gentle rain from heaven, taking up kinetic energy as it makes its way back to ordnance datum (standard sea level), itself controlled by the balance of the global greenhouse.

En route this living water absorbs minerals from both soil and bedrock sufficient to nurture the pulse of life itself, tiny herbs, some full of the power of healing, and the natural vegetation that generates organic soil. The trees, reaching up to the Sun, power houses for transforming energy, are driven by living water, ameliorating the climate near the ground, controlling erosion and helping to maintain the life-giving water cycle.

If this cycle gets out of balance in any way, the consequences are dire, as insurance companies are now discovering. Drought, floods, winds and wild fire out of control, and perhaps worst of all, eutrophication, the clever name for too many nutrients choking the very arteries through which living water used to meander its self-cleansing way down to the sea.

There is much in Schauburger's philosophy that gets up the noses of the science that sees only financial profit at the end of their glass telescope of knowledge. Alick Bartholomew is to be congratulated for bringing Schauburger's vision into focus in this book at the most opportune time. Wave power is beginning to come on stream

with the promise of base load electricity cheap enough to split, not the polluting atom, but the water molecule, into oxygen and hydrogen — the latter to fuel the much discussed non-polluting, fuel cell-based, hydrogen economy.

Is this a wise strategy? In the absence of Schauburger as my mentor I sat beside the stream in my garden with Tornado jets making warlike passes overhead, and watched a trout enjoying what are perhaps the only real human rights, peace and access to living water.

David
Bedburn, February 2003

Bellamy,

Introduction

'I no longer own my own mind. I don't own even my own thoughts. After all I've done, finally there is nothing left. I am a man with no future.'¹ These were the words of Viktor Schaubberger, an Austrian naturalist, the pioneer of Eco-technology (working with Nature) who had devoted his life to demonstrating how the desecration of our environment proceeds directly from our complete ignorance of how Nature works at the energy level. His controversial credo was that humanity must begin, with humility, to study Nature and learn from it, rather than try to correct it. We have put the future of humanity at risk by the way we produce and consume energy. His aim was to liberate people from dependence on inefficient and polluting centralized energy resources and generation of power.

Viktor was communicating his distress to his son, Walter, on the plane home from Texas after a nightmare of exhausting cross-examination to extract the secrets of the devices he had developed which demonstrated free energy, anti-gravity and fuel-less flight. He died five days later on September 25, 1958, in Linz, Austria, of a broken heart. Father and son had embarked on an ambitious, but ill-conceived, scheme hatched by an American consortium¹ which probably had CIA and atomic energy connections, in order to persuade him to give up the keys to his mysterious research (see Chapter 18). Schaubberger had in 1944, under threat of death, been forced to develop a flying saucer programme for the Third Reich, the secret weapon which, had it been initiated two years earlier, might well have tipped the war's balance in Germany's favour.

Schaubberger's inspiration came from studying the water in fast-flowing streams in the unspoilt Austrian Alps, where he worked as a forest warden. From his astute observations he became a self-trained engineer, eventually learning, through the implosive, or centripetally moving, processes that Nature uses, how to release energy 127 times more powerful than conventional power generation. By 1937 he had developed an implosion motor that produced a thrust of 1,290m/sec, or about four times the speed of sound. In 1941 Air Marshall Udet asked him to help solve the growing energy crisis in Germany; however the research came to an end when Udet died and the plant was

subsequently destroyed by Allied bombing. When in 1943 Heinrich Himmler directed Viktor to develop a new secret weapon system with a team of engineer prisoners-of-war, he had no choice but to comply.

The critical tests came just before the end of the European war. A flying disc was launched in Prague on February 19, 1945, which rose to an altitude of 15,000 metres in three minutes and attained a forward speed of 2,200kph.² An improved version was to be launched on May 6, the day the American forces arrived at the Leonstein factory in Upper Austria. Facing the collapse of the German armies, Field Marshal Keitel ordered all the prototypes to be destroyed.

Schauberger had moved from his apartment in Vienna to the comparative safety of Leonstein. Meanwhile the Russians pushed in from the East and captured Vienna; a special Soviet investigation team ransacked his apartment, taking away vital papers and models, and then blew it up.

The Allies seemed to be well aware of Schauburger's part in developing this secret weapon. At the end of hostilities, an American Special Forces team seized all the equipment from his Leonstein home and put him under 'protective U.S. custody' for nine months' debriefing. It seems likely that they could not fathom his strange science, for they let him go, although this group, detailed to enlist as many of the front-line German scientists as possible, took back scores of other 'enemy' scientists to give a vital boost to American industrial and military research. They forbade him from pursuing 'atomic energy' research, which would have left him free to follow his dream of fuel-less power.

For the following nine years Viktor could not continue his implosion research because the high quality materials needed for his very advanced equipment were beyond his means, and he had no sponsors. In addition, he may have been haunted by remorse for having been forced by the German SS to design machines of war. Schauburger was essentially a man of peace who, above all, wanted to help humanity become free; so he turned his attention to making the Earth more fertile, developing experimental copper ploughshares.

Levitation and resistantless movement

This strange life path had started on his return to civilian life after the First World War, when Viktor Schauburger went to work in the mountains. His experiences of unspoilt Nature were life-changing.

One such that would set him on a lonely course to change the course of human life for ever, he describes graphically:

It was spawning time one early spring moonlit night. I was sitting beside a waterfall waiting to catch a dangerous fish poacher. Something then happened so quickly; I was hardly able to grasp it. The moonlight falling onto the crystal clear water picked up every movement of a large shoal of fish gathered in the pool. Suddenly they dispersed as a big fish swam into the pool from below, preparing to confront the waterfall. It seemed as though it wanted to scatter the other trout as it quickly darted to and fro in great twisting movements.

Then, just as suddenly the large trout disappeared into the huge jet of falling water that shone like molten metal. I could see it fleetingly, under a conically shaped stream of water, dancing in a wild, spinning movement, which at that moment didn't make sense to me. When it stopped spinning it seemed then to float motionlessly upward. On reaching the lower curve of the waterfall it tumbled over and with a strong push reached behind the upper curve of the fall. There, in the fast flowing water, and with a strong movement of the tail, it disappeared.

Deep in thought, I filled my pipe, and as I wended my way homewards, smoked it to the finish. Often subsequently, I witnessed the same sequence of behaviour of a trout leaping up a high waterfall. After decades of similar observations that manifested like rows of pearls on a chain, I should be able to come to some conclusion. But no scientist has been able to explain the phenomenon to me.

With the right lighting, it is possible to see the path of levitational currents as an empty tube within the veil of a waterfall. It is similar to the tunnel in the middle of a circulating vortex of water plunging down a drain, which brings up a gurgling sound. This downwardly-directed whirlpool drags everything with increasing suction with it into the depths. If you can imagine this whirlpool or water-cyclone operating vertically, you get the picture of how the levitational current works and you can see how the trout appears to be floating upward in the axis of fall.³

INTRODUCTION

Viktor used to spend hours watching fish in the streams. He was fascinated by how the trout could lie motionless in the strongest current and then, if alarmed, without warning, would dart upstream rather than be carried down with the flow. Having learned from his family about the importance of temperature on the energy potential of water, he did an experiment. He had colleagues heat up 100 litres of water that, on his signal, they poured into the fast-flowing mountain stream some 150 metres upstream from where he stood. Viktor noted how the trout he had been observing became agitated, and soon was unable to hold its station in the fast flowing stream, thrashing its tail fins to no avail. The minute, but nevertheless abnormal, rise in the average temperature of the water and the chaoticized flow that resulted, had interfered with the trout's hovering ability. Viktor searched the textbooks in vain for an explanation of this marvel.

He would often quote these experiences with the trout as having the most influence on developing his ideas, for temperature and motion were the foundations of his theories and discoveries. He subsequently developed a generator to produce energy directly from air and water, naming it the 'trout turbine' in honour of his mentor, though it was later called the 'implosion machine.'

The non-conformist

Viktor Schauberger was discredited and criticized by 'the experts,' as pioneers have been in the past, from Galileo to Max Planck. He insisted that we have betrayed our calling and our heritage, by usurping the role of God and trashing our environment. He saw that we were hell-bent on a path of self-destruction, and predicted that, within a generation, our climate would become more hostile, our food sources would dry up, there would be no healthy water, and illness, misery and violence would predominate.

Where have conventional scientists gone astray? By not observing carefully how Nature works. If they did, they would be able to formulate her laws, as Schauberger has done, and then comply with them, so that human society could come into harmony with our environment. As he so often said, 'Comprehend and Copy Nature.' Instead, modern scientists believe we are above Nature and are free to exploit the Earth's resources without consequence.

Schauberger spelled out clearly exactly where we have gone wrong with our technology. How can we start to put things right?

HIDDEN NATURE

Certainly by a complete reversal of the way we do things. This can involve only a sea change in the way we regard our lives, and a personal commitment to help bring about a major shift in our society. Only through sufficient numbers joining together in common cause can these changes begin.

He criticized mainline science for its arrogance and herd instincts. He also castigated scientists for their blinkeredness, their inability to see the connections between things. Schauberger did not blame the political hierarchy for the world's woes, as we often do today. He believed that political leaders are basically opportunists and pawns of the system. It was his own adversaries, the 'techno-academic' scientists as he called them, whom he held to blame for the dangerous state of the World.⁴

Visionaries and pioneers are inevitably a challenge to the establishment in whatever field, for they pose an imagined threat to the interests of those who benefit from the status quo. The degree of vilification seems to depend on the level of rewards at stake. Thus science, as perhaps the most exclusive and arrogant of disciplines, has done so much throughout history to undermine great innovators like Copernicus, Kepler and Galileo to, in our times, the biological pioneers James Lovelock, Rupert Sheldrake and Mae-Wan Ho.

Despite, or perhaps because of, his interrupted education, Viktor retained a great thirst for knowledge. His wife found domestically disruptive his tendency to stay up all night, pouring over books of every kind, especially the more esoteric variety. There was no question that Viktor felt he had a calling. This was evident from the fact that often he seemed to write in a trance-like state, returning to normal consciousness quite surprised by what he had just written!

Schauberger was a man of unshakeable self-confidence and inner conviction about the viability of his theories, and unsurprisingly had a lifelong battle with orthodoxy. Callum Coats describes how on one occasion during the Nazi era, good fortune saved his life from being taken in a sinister way.⁵ He did, however gain important support. This was inevitably from the few scientists who were not swayed by greed or jealousy and were of more independent mind. One was the Swiss Professor Werner Zimmerman, a well-known social reformer who published articles by Viktor in his ecologically oriented magazine *Tau*. Another was Felix Ehrenhaft, professor of physics at the University of Vienna, who helped with Viktor's calculations for his implosion machines. A third very

loyal friend was Professor Philipp Forchheimer, a hydrologist of world repute.

Most people have heard of Viktor Schauburger only in connection with his inspired ideas about water or of the energy-saving machines that harnessed the enormous power encapsulated in lively water. They were, indeed, so fundamental and important as to justify his reputation as an ecological pioneer. However, as we are concerned with the broader challenge of restoring the damage wrought by humanity on the Earth, we shall need to present Schauburger's larger worldview of how Nature works.

Walter Schauburger, who unlike his father, had a formal education in science and was, for a time, a university lecturer in physics, worked hard to make Viktor's ideas more accessible to mainstream science. After he did a lecture tour in 1950 at a number of England's top universities, some of the distinguished scientists were asked what they thought of the Schauburger physics. While they agreed that the theories were quite convincing, the problem, it appeared, was that 'it would mean rewriting all the textbooks in the world.'⁶

An alternative worldview

Viktor Schauburger suffered much from the vindictiveness of the scientific establishment towards him. Nevertheless, his constant complaints about them obscure his principal message, which is far more important than academic arrogance per se. This is that our whole culture is completely under the thrall of a materialistic worldview or way of seeing; we are caught in the excitement of apparently being free to do anything we want, and by the glamour of possessing lots of riches and distractions. Our science is but the product of this worldview, as is our philosophy and education, our religion, our politics and our medicine. You don't need to subscribe to conspiracy theories to realize that all aspects of our society suffer from a grand delusion that is contributing to the breakdown of our world order and to the collapse of our ecosystems.

The real issue is that the intellectual movement of the late seventeenth century, the Enlightenment, and its equivalent in science, Rationalism, have caused a great schism in human society. The philosopher Rene Descartes (famous for his 'I think therefore I am') has a lot to answer for. That movement put man on a pedestal, introduced the idea of humanity being apart from Nature and started to

interpret all natural phenomena by a process of deduction. The effect has been a separation of thinking from experience, of head from heart. Because of the dominance of scientific determinism in our culture, the more intuitive way of knowledge is considered as suspect, but there is a new awakening taking place at all levels of society of people wanting to get in touch with their intuition, who feel that rationalism is in fact the Great Delusion.

We have experiences every day that fall outside the accepted conventions of reality; like little synchronicities, intuiting events, the sensing of different qualities of 'atmosphere' as emanations from people, situations or places, the power of thought over action, communication with a household pet. If we share these with like-minded friends we feel like conspirators discussing something taboo that the thought police might catch. At best these phenomena might be labelled woolly, like 'psychic' experiences. We are lost because there is no system or structure to 'make sense' of an important part of our lives. They are not part of conventional wisdom.

Viktor Schauberger was one of the first to put in a scientifically verifiable framework a study of natural processes set free from the constraints of rationalism. He has widened our understanding of our place in the world by describing a worldview of a natural science that includes these experiences without recourse to scientific, religious or philosophical dogma. By understanding how Nature works, we can begin to relate our experiences to a much wider and more exciting worldview. Rachel Carson, who is credited with having initiated the environmental movement with her book *Silent Spring*, was a brave woman for taking on the multinational corporations. Schauberger is all the braver for taking on our conventional worldview.

There must be a fundamental change in the way we see the world (including our environmental policies), before change is possible. Have Viktor's warnings been vindicated? It is over 45 years since his untimely death, and much of what he prophesied has come to pass even earlier than he foresaw. There was some hope before September 11, 2001, that environmental awareness was gaining ground, if slowly. Recognition of the critical imbalances we have created in our atmosphere and of the urgent need to change our priorities from consumption to conservation was starting to spread. Now we seem to have backtracked a generation and we can't even agree to implement the kind of cuts in carbon dioxide emissions that are essential to avoid catastrophic climate change.

INTRODUCTION

We feel that Schauberger's perceptions are a vital key to understanding where our culture has gone wrong and that our future as a species depends on being able to reconnect with the natural processes he rediscovered. We shall, therefore, bring into twenty-first century relevance his views of how Nature works and where our society has gone wrong, to see what we can learn from his insights.

Viktor has a singular way of deprecating our culture, as the following comment on our conditioning reveals:

Humanity has become accustomed to relate everything to itself (anthropocentrism). In the process we have failed to see that real truth is a slippery thing upon which the perpetually reformulating mind passes judgment almost imperceptibly. In the main all that is then left behind is whatever was drilled into our brain with much trouble and effort, and to which we cling. To give rein to free thought, to allow our minds to flow freely and unimpeded, is too fraught with complications. For this reason the activity arising from these notions inevitably becomes a traffic in excreta that stinks to high heaven, because its foundations were already decayed and rotten from the very beginning. It is no wonder, therefore, that everywhere everything is going wrong. Truth resides only in all-knowing Nature.⁷

Schauberger predicted that modern human culture's destruction of the creative energies of Nature would result in greater violence and depravity in society. If we were to pay heed to what Nature requires of us, would we witness a reversal of this observable deterioration, and a gradual coming back into balance of a human society that would eventually be able to live in tune with Nature?

But as in our hubris we believe we are at the peak of material human achievement, there is a reawakening of the human spirit, and a great need is being reborn to reconnect with Nature, with our source. This book attempts to encourage and nurture this need.

Towards a science of Nature

The majority of people in the UK oppose the genetic modification of food because they know in their hearts it is against Nature. The policy is being driven by the commercial interests of big business supported by a compliant political climate. Above all, it is justified

by a science with a materialist worldview that believes Nature exists to be manipulated and exploited for the imagined benefit of humanity. Accountability is apparently not an issue.

The national debate on GM held in Britain in 2003 showed that most people are deeply disturbed by the arrogance of the view that Man can do anything he wants on this Earth. But they have no science to turn to for rebuttal. What is needed is a Science of Nature to supplant the misguided science presently taught in our schools and universities. We need to work with a holistic view of Nature as omnipotent on the Earth, whose laws govern us humans as well and which we flout at our peril — in brief, a Nature with which we must learn to cooperate with humility.

What are these laws of Nature? How are we to know what is our place, and what is demanded of us? Viktor Schauburger excelled as a teacher of the science of Nature. He describes and illustrates, as few have done, how Nature works, with its marvellous and complex processes at the heart of the evolution of consciousness.

Viktor Schauburger is known at present only to a small, holistically-inclined audience that has a strong commitment to environmental issues, to organic growing or to the development of alternative energy sources. Much of the literature on Schauburger is sometimes difficult to follow for the less committed. This book draws on Callum Coats' seminal book on Viktor's work, *Living Energies*. We hope that the less technical approach of our book will facilitate for a broader audience how indispensable are Schauburger's insights if we wish to understand our present ecological predicament. The great ideological conflict of this new century will be between the very limited and flawed mechanistic/deterministic worldview and the holistic understanding of life as a wondrous, intimately interconnected and spiritual whole.

PART ONE



An Alternative Worldview

1. Viktor Schauberger's Vision

Our natural world is essentially an indivisible unity, but we human beings are condemned to apprehend it from two different directions — through our senses (perception) or through our minds (conceptual). A child just observes and marvels, but as our rational minds become trained we are taught to interpret what we see, usually through other people's ideas, in order to 'make sense' of our sensory experience. Both are forms of reality, but unless we are able to bring the two aspects meaningfully together, the world will present nothing but incomprehensible riddles to us. This, in fact, is the basic shortcoming of our present human society. It is the great weakness of the prevailing scientific orthodoxy. As Schauberger noted:

The majority believes that everything hard to comprehend must be very profound. This is incorrect. What is hard to understand is what is immature, unclear and often false. The highest wisdom is simple and passes through the brain directly into the heart.¹

Some of the pioneers of science were able to bridge this dichotomy. Their way was to immerse themselves so deeply in the world of pure observation and experience, that out of these perceptions the concepts would speak for themselves.

Viktor Schauberger (1885-1958) possessed this rare gift. As a result of this, more than anyone else of his time he foresaw, as early as the 1920s, the environmental crises in which we are now engulfed. Viktor's forebears had a long tradition of caring for the welfare of the natural forest and its wildlife in the Austrian Alps. Although he was born into a family that cherished unspoiled Nature, Viktor, like most pioneers, was the rebel amongst them.

Born one of nine children, he seemed to get on well with his siblings. His father, nicknamed after the legendary giant 'Ruebesahl,' as he was 6' 8" tall, did not relate well to the young Viktor. He resented the young man rejecting his paternal advice to improve himself with a modern academic training. His brothers acquiesced with their father. The one to whom Viktor remained closest was his

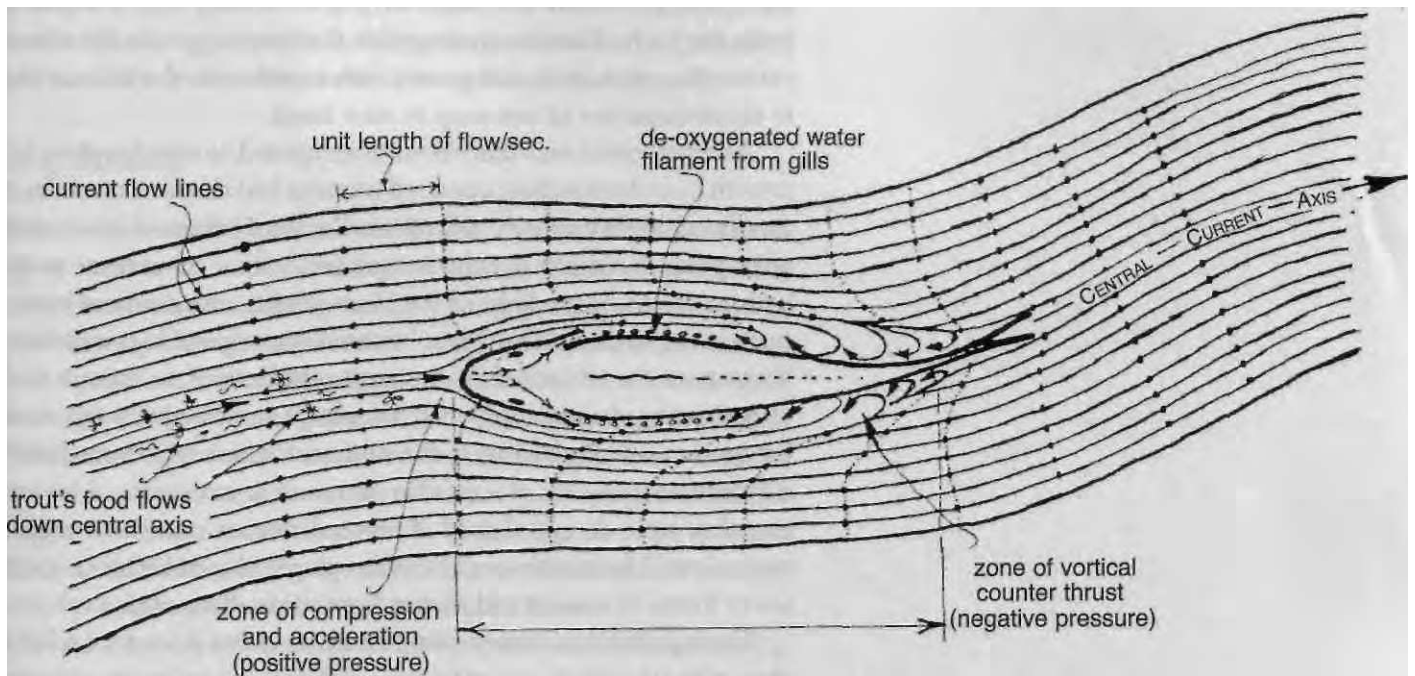
mother. But he told how both his parents believed in the healing power of water, and of their insight that the quality and transportive power of water in a stream was particularly strong on a cold night, and more so under a full Moon.

Viktor was a dreamy child, but was endowed with an extraordinary quality of observation, a keen intellect, and evident intuitive and psychic abilities. As a boy he would spend hours by himself in the forests, exploring streams, watching the animals and studying the plants. He was able to experience first hand what he had first heard from his family, and more, about the life of the natural forest and its creatures. He had no interest in the academic path and declined the opportunity to go to forestry college. He did some more practical training instead, and served an apprenticeship under an older forest warden. Married young, Viktor moved to a post in a virgin forest 93 miles (150 km) south into the mountains. Four weeks after his son was born, Viktor was drafted in 1914 into the Kaiser's army.

After the war he quickly rose from junior forest warden to game-keeper and became the head warden of the forest and hunting domain in Brunnenthal/Steyerling owned by Prince Adolf zu Schaumburg-Lippe. In this large wilderness area, almost untouched by man, Schauburger was able to study how Nature works when left undisturbed. Here biodiversity was undamaged, with many magnificent trees, an abundance of wildlife, and unspoilt streams teeming with fish and other creatures.

The water wizard

Water was always Viktor's fascination. One day, accompanied by his foresters, he came to a remote upland plateau where there was a legendary spring that emerged from a dilapidated dome-like structure. Schauburger ordered it to be pulled down for safety reasons. One of the older foresters then warned him that if the structure were removed the spring would dry up. Taking note of the old forester's advice, and as a verifying experiment, Schauburger requested that the structure be carefully dismantled, with each stone numbered and its place marked. When Viktor passed again some two weeks later, he noted that the spring had indeed dried up due to exposure to the Sun's rays. Immediately he ordered the structure to be carefully rebuilt and a few days later the spring began to flow again. This taught him that water liked to flow in cool darkness.



Viktor's abiding interest was to discover how to generate energy using Nature's own methods. He worked out how a trout is able to screw its way up a waterfall by hitching a ride on strong levitative currents, and using this principle, the first generator he developed was the 'trout turbine.' To perfect this he needed more precise information on how a trout is able to stand motionless in a fast moving current, and indeed how it can suddenly accelerate upstream. The above diagram illustrates this amazing phenomenon (Fig. 1.1).

The trout is holding its station in mid stream where the water is coldest, densest and has most potential energy. Viktor studied the gills of the fish and found what he thought were guide vanes which would direct the water flow into a powerful backwards vortex current. Its shiny scales minimize friction with the water, but they also create scores more of little vortices that amplify the upstream counter current, particularly towards the tail, which cancel out the pressure on the fish's snout. A zone of negative thrust is created along the whole of the trout's body and so it stays in the same place. These counter currents can be increased by flicks of the tail, creating negative pressure behind the fish. Flapping of the gills amplifies the vortices along its flanks, giving it a sudden push upstream. The

Fig. 1.1. The stationary trout. The trout normally swims in the middle of the central current, where the water is densest and coldest. Its body displaces and compresses the individual water filaments causing them to accelerate. As their critical velocities are exceeded, vortices or countercurrents are formed along the rear part of the trout's body, providing a counterthrust to the current, allowing the trout to remain stationary in the fast flowing water. If it needs to accelerate, it flaps its gills, creating a further vortex train along its flanks, increasing the counterthrust upstream.

faster the gills move the more oxygen-deficient water is expelled from the body. This combining with the free oxygen in the water, causes the water body to expand, with an effect on the fish similar to squeezing a bar of wet soap in your hand.

Another experience that Viktor often quoted as significant for his growth in understanding, occurred when he had shot a chamois buck on a frosty night under the full Moon. The buck fell into a ravine and, attempting to retrieve it, Schauberger fell down a snow chute to the bottom. In the bright light of the Moon, he became aware of movement in the stream below where he stood. Some green logs were bobbing up on the surface, then sinking to the bottom, as though they were dancing. And not only that, but a large stone began to gyrate at the bottom, and then came to the surface, where it was immediately surrounded by a halo of ice. Other stones also surfaced, and he saw that they were all egg-shaped. It seemed that no uneven or ragged stones would float in this way. Schauberger developed his ideas of different forms of motion and shapes from these observations.

Having seen how water could carry its greatest load on a cold, clear night, he made practical use of this observation. During the winter of 1918, the town of Linz was suffering a severe shortage of fuel as a result of the war when the draft animals had been commandeered. There was a small stream that ran through narrow gorges and which was considered unsuitable for transporting logs, but he wanted to try out his ideas using this stream. His offer to help being accepted by the authorities, he describes how he proceeded:

I had observed that an increased water level after a thaw builds up sandbanks that are then partially dispersed when the water temperature drops during clear cool nights. I then waited for an increase in the strength of the water current. This takes place in the early hours of the morning, when it is coldest, and particularly at full Moon, although the volume of the water is apparently less due to its compression on cooling. I planned for the timber to be put in the stream under these conditions, and in one night 1600m³ were brought down to the valley.

Viktor had discovered that when water was at its coldest, it had much more energy that enabled it to carry more sediment, gouging out deposits of sand, and concluded that in these conditions it would be

able to carry a greater weight of logs. This was a principle that enabled him to turn upside down the current theories of hydraulics, and particularly the methods of river and flood management.

Log flumes

Schauberger was looking for a way to demonstrate to others his ideas about movement in Nature, and to discuss them with technical experts and scientists. His opportunity came in 1922 when the owner of the forest and hunting reserve on which Viktor was a junior warden, Prince Adolf zu Schaumburg-Lippe, was looking for a way to avoid bankruptcy. (His wife, the Princess, had very expensive tastes.) After World War I there was a demand by the expanding building industry for timber, and inaccessible stands of mature trees were earmarked for felling. The timber flotation methods of the time were fairly crude, straight channels running down the valleys, which caused the logs enormous damage, many being good only for firewood.

The Prince offered a prize for the construction of a flume to bring logs down from the remote areas, and Viktor eagerly submitted his plans. These were, however, rejected by the administrators of the estate as totally unworkable, as the proposed method went completely against accepted hydraulic principles. Through a chance meeting on a hunting expedition, the Princess asked Viktor what savings could be achieved through his method. On claiming that he could offer a cost of one schilling per lm^3 against the normal cost of 12 schillings per lm^3 for flotation, she offered to have his salary trebled should he succeed, despite his lack of academic qualifications. The Prince, driving a hard bargain, made a condition that Viktor should build the flume at his own expense and that it had to deliver a minimum of $1,000\text{m}^3$ daily.

There was much scoffing by the experts who judged Schauburger completely mad, and who made malicious predictions of the outcome; as Viktor describes:

The construction was completed after some four months. The great timbers were in position. The day before the inauguration I tried a test. An average sized log was put into the flume. It floated down for about 100 metres and then suddenly grounded on the bottom, causing the water behind to rise and overflow the flume. I saw the scornful faces of my workers, realized that I had miscalculated and felt discouraged. The log

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was taken out of the flume. I thought that there was too little water and too sharp a drop. I did not know what to do. So I sent my workers home so that I could quietly consider the problem.

The curves of the flume were correct; of that there was no doubt. So what had gone wrong? I walked slowly along the flume until I came to the trap and the sorting basins, from which a further length of flume continued. The basins were full. I sat on a rock above the water in the Sun.

Suddenly I felt something moving below my leather trousers. Jumping up I saw a coiled snake. I picked it up and threw it away; it fell into the basin and tried to get out, but the bank was too steep. As it swam back and forth I was amazed that it could swim so fast without fins. Observing it through my binoculars I saw its peculiar twisting movements in the clear water. Finally the snake reached the far bank. For some time I stood quietly and went over in my mind the snake's bodily movements of horizontal and vertical curves. Suddenly I understood how it had done it!

The snake's movement was that of a spiral space-curve twisting like the horn of a Kudu antelope. Calling back his workers, he ordered the holding basin to be emptied and the log removed. He then gave instructions to attach thin wooden slats to the curved sides of the flume walls, which would act like the rifling in a gun barrel, and would make the water rotate anti-clockwise on left hand bends and clockwise at right hand bends. Promised double wages, they worked through the night, and the adjustments were completed in time for the opening in the morning.

The inauguration of the flume was attended by the Prince and Princess, by the Chief Forestry Commissioner and a number of hydraulic specialists, the last ready to gloat over Viktor's humiliation. After greeting the royal couple and the head forester, he continued:

I opened the lock, behind which my workers started to arrange the smaller logs in the water. Unnoticed, a heavier log about 3ft (90cm) in diameter went in with the others. The senior log master shouted, 'We cannot have that one.' I gave a quick wave and the unwanted log floated high, towards the outflow. Quickly it created a blockage that raised the water level. No one said anything, staring at the log rising out of the

water, waiting for the flume to overflow. Suddenly there was a gurgling noise. The heavy log swung first to the right, then to the left, twisting like a snake, its head high as it floated away quickly. A few seconds later the log slipped through the first curve and was gone.

Schauberger's flumes followed the curves of the valley, with guide vanes mounted on the curves, making the water spiral along its axis. With the careful monitoring of temperature along the route, bringing in cold water where necessary, he found it was possible to float logs under conditions regarded as impossible, using significantly less water, and achieving very high delivery rates. Parts of his flumes can still be seen in Austria today.

The flume at Steyrling was a great success, much to the chagrin of the observing hydraulic engineers who were so sure his crazy scheme would fail. Schauburger's fame quickly spread. Experts came from all over Europe to study the flume's construction. He was appointed State Consultant for Timber Flotation at a high salary. The academics were furious that he could give directives on technical questions which he could not understand with his inadequate education, and that he was paid twice as much as any of them. In the crisis that followed, Viktor resigned, and accepted a job with one of Austria's largest building contractors for whom he built installations all over Europe. If this has been his only accomplishment, Viktor Schauburger would still be known as the man who completely mastered the art of transporting timber by water.

Water, source of life

His painstaking and inspired studies of water were the source for a seminal paper that Schauburger wrote on 'Temperature and the Movement of Water.'² Central to these was the influence of minute differences in temperature, which are presently wholly ignored by modern hydraulics and hydrology. Natural, living, water, which is conventionally regarded as a homogenous substance, he showed to be composed of many strata or layers with subtle variations in temperature and electric charge which influence the water's motion, its form of flow and its physical properties.

Schauberger saw water as a pulsating, living substance that energizes all of life, both organic and inorganic. He called it 'the life blood

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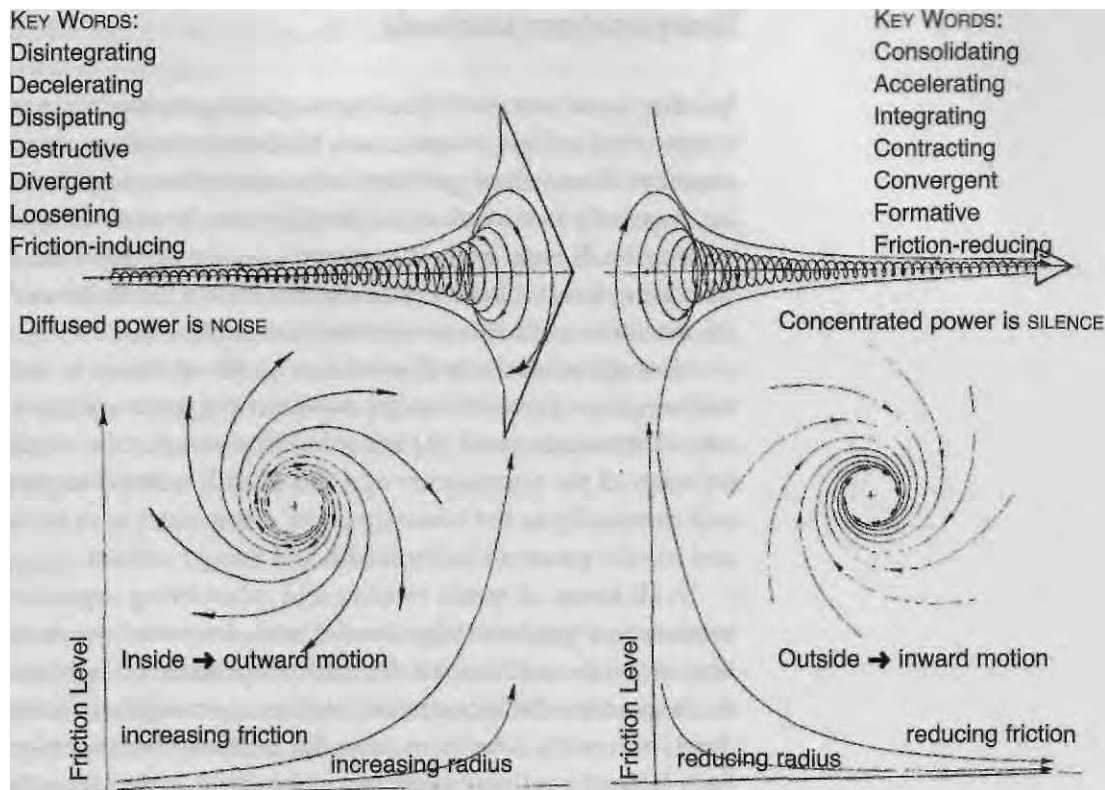
of the Earth.' Whether as water, blood or sap (which are essentially water), it is the indispensable constituent of all life-forms, and its quality and temperature is fundamental to health. When it is healthy it has a complex structure that enables it to communicate information, carry energy, nutrients and healing, to self-cleanse and discharge wastes. He believed that one of the causes of the disintegration of our culture is our disrespect for and destruction of water, the bringer of life, for in doing so we destroy life itself. Viktor also profoundly believed that our dangerous technologies produce poor water that has lost its energy and its ability to pulsate — and is effectively lifeless. This dead water produces inadequate nutrition, and Viktor believed that its regressive energies are responsible for degenerative diseases like cancer, for lower intelligence and for community turmoil.

Natural forests (not the monoculture plantations of today) are the cradle of water and also the main source of oxygen for the planet. Their precipitate destruction, Schauberger predicted, would result in global warming, severe water shortage and the creation of deserts. He made brilliant observations of the way in which trees in a natural, diversified environment are biocondensers of energy (accumulating and storing energy from both Sun and Earth) — how the groundwater (man permitting) brings Earth's energy to the tree in order to balance the Sun's energy.

Motion is crucial

An understanding of motion may be the most important of Schauberger's discoveries. Our current technology uses the wrong form of motion. Our machines and processes channel agents such as air, water, other liquids and gases into the type of motion that Nature uses only to decompose and dissolve matter. Nature uses another form of motion for creating and rebuilding. Our technology's mode of motion creates chaos, noise and heat, bringing disease to organisms and the breakdown of structures. Visualize if you will, what happens in an explosion — matter is torn apart, fragmented and destroyed. Its effect is to create degraded energy. Through its dependence on the decomposing mode of motion our technology creates enormous energy pollution and entropy, dangerously affecting the vital biodiversity and balance of our ecosystems. Our mechanical, technological systems of motion are nearly all heat- and friction-inducing, with the fastest movement at the

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periphery (as in a wheel), a form of motion that is disintegrative, noisy and inefficient; this is the way we generate our power — centrifugally. By contrast, Nature uses the opposite, centripetal, vortical form of motion, moving from the outside to the inside with increasing velocity, which acts to cool, to condense, to structure, assisting the emergence of higher quality and more complex systems.

Spirals are a basic form of motion in Nature, but Schauberger's recognition of the vortex (see p. 42) as the principal creative movement system in the Universe is at the core of his Eco-technology and the key to his valuable implosion research. From the tornado to plant growth, it is Nature's mechanism for transforming energy from one level to another (Fig. 1.2).

Asked about our technology 'How else should it be done?' Viktor's answer was: 'Exactly in the opposite way that it is done today.' He saw that the potential for creating energy for human needs by replicating the in-winding motion of Nature was the way of the future.

Fig. 1.2. Centrifugal and centripetal movement. Comparison between axial>radial (inside>outwards) motion, the way our current technology works, and radial>axial (outside>inwards) motion, Nature's way of generating creative energy.

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Temperature controls

Another cornerstone of Viktor's ecotechnology is the importance of temperature in Nature's processes. Modern technology creates vast amounts of waste heat (entropy) which contribute to global warming, especially in cities and industrial centres (carbon dioxide from burning fossil fuels being the principal source of global warming). Increasing heat will ultimately destroy life on Earth. Nature's creativity, however, thrives on measured coolness.

Most significantly, he showed how small variations in temperature are as crucial to the healthy movement of water and sap as they are to the human blood. He identified in particular the importance for water of the temperature of +4°C (39°F), referred to physically and chemically as the 'anomaly point,' when water is at its densest and has the greatest vitality, health and energy content.

In all forms of water, in trees and other living organisms, the temperature gradient (the upward and downward movement of temperature) is active. In the natural process of synthesis and decomposition, the temperature is either approaching (positive gradient) or moving away from (negative gradient) the anomaly point. Each form of gradient has its special function in Nature's great production; the positive (cooling) temperature gradient must play the principal role if evolution is to unfold creatively. We shall be looking at this in more detail in the appropriate chapters.

Schauberger found that temperature changes according to certain patterns and cycles that activate life and death, bringing increase and decrease, decomposition and renewal. Temperature controls the innate energies that produce the pulsations that punctuate and control all life's processes. These energy pulsations which at one moment dissociate or disconnect, and at another recombine both energy and matter, are the mechanism for creating the countless individualities and qualities that make up life as we know it. Viktor said that the cyclical change of temperature creates the conditions suitable for the evolution of new individual life forms or the renewal of existing ones.

Evolution

Viktor Schauburger recognized that Nature's evolutionary purpose is to facilitate the emergence of higher life forms, to promote greater

complexity of interrelationships and to raise the level of consciousness of the higher life forms, all a consequence of the continual refinement of energies.

Viktor showed that highly ordered systems lose their stability when their environment suffers deterioration. He predicted that a decrease of biodiversity in Nature would bring an increase in violence and a degeneration of spiritual qualities in the human community.

We think of evolution in terms of technological development. But if one aspect of potentiality is developed at the expense of the others, you end up with an unbalanced person, or even with a monster. This is one of the most important lessons our culture has to learn. It might well apply to the unregulated biotechnology industry. What level of crisis will be required to force us to rethink our priorities and change direction?

Balance

Perhaps the most important of Schauberger's insights that we have to heed is the importance of balance in Nature. The nature of some attribute of an organism, its wholeness or unity is composed of two seemingly opposed qualities in resonant balance. Thus, for example, both egoism and altruism are necessary as human qualities, but for evolution to proceed, altruism must be more in the ascendant. Because our culture has emphasized the coarser qualities, our creative evolution has been arrested, and we have attracted the darker energies of degeneration, with increasing disorder and violence as the outcome.

All the qualities found in Nature have a coarser physical aspect that our worldview attracts, to the discouragement of higher, more subtle energies; we shall be looking at how this impinges on the environment as a whole. In this way Nature's balance is upset, the most obvious being the supremacy today of the more aggressive energies of humankind.

Implosion

Nature's methods of producing energy are silent, but inherently far more effective and powerful than our mechanical techniques, as Schauberger was to prove with his implosion machines that produced prodigious amounts of power. The difference between the

two forms of energy production is fundamental to the quality of any process in our world.

Not only does this implosion technology produce much more energy than the 'explosive' methods currently employed, but it creates no waste, pollution, global warming or other damage to Earth's fragile ecosystems. Schauberger invented a number of 'over-unity' machines that produced a substantial excess of power over input. These included means of propulsion for aircraft, submarines, and cars; different devices that produced power, coolness or heat for the home, and invaluable machines for making high quality springwater from polluted water. Unfortunately the working models were destroyed at the end of the Second World War, and his detailed drawings are missing.

His descriptions of these appliances have inspired a number of inventors searching for 'free energy' generation. It seems that no-one has quite succeeded in replicating one of Viktor's, but there are some promising devices ready to go into production. The main obstacles to their introduction include personal harassment from agents of the energy 'establishment,' the lack of imagination by politicians and investors, and the vested interests of the fossil fuel industries, whose lobbying of government is bent on delaying as long as possible the day when people will be able to gain their true independence by producing cheaply their own power needs at home, as Schauberger envisaged.

The visionary

What we have to take on board, as it were, is the extent to which the degraded energies of our present technologies are polluting the world, both from excess heat, but more particularly because they not only block or impede the natural productive and healing energies, but actually encourage degeneration. We can reduce global warming by significant reductions in CO₂ emissions. But we cannot hope for the long-term survival of humanity without ditching our current technology models for those that are wholeheartedly Nature-friendly. Schauberger shows us the way ahead. For example, ecotechnologies are being introduced into the fragile Himalayan ecosystems of Ladakh, as a means of securing economic self-sufficiency for a proud people who are losing their independence in the face of imposed economic exploitation from outside.³

Viktor Schauberger came from a background that was rare even a century ago. Several generations of his family had lived in the unspoilt Alpine forests. They understood many of Nature's laws. Viktor's refusal to go to college came from a fear of being indoctrinated, as he believed he would lose both his intuition and his ability to see the magical interconnections within Nature. His natural ability voluntarily to change levels of awareness was the key to his singular discoveries of how Nature works. He was able to enter a more refined state of consciousness, as when he describes how he let his awareness enter the flowing water in a stream, ready to bring back intuitions of what the water required for its health.

This book is not about going back to some romantic past, or about discarding science as a discipline, or technology as a means of making our lives more effective. It is about, as Schauberger used to say, 'thinking an octave higher.' Viktor was a supremely capable scientist, an impeccable observer, a thorough researcher and an inspired inventor. He also predicted, seventy years ago, the climate change disasters that we are now experiencing, and the moral and spiritual collapse of our civilization. But he also, supremely, gave us the keys to reclaiming our heritage as true guardians of Nature and, as we shall see, showed us how to repair the damage we have done to our precious Earth.

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2. Different Kinds of Energy

Subtle energies

In the last 200 years, the application of increasingly complex technologies has accelerated enormously, overwhelming the far more subtle energy systems of Nature, with dire consequences for us all. For while some will argue that these have brought benefits to many on the material level, the quality of life on the planet has seriously deteriorated, with severe damage to ecosystems and to biodiversity.

No one explains, as convincingly as Schauberger, just how this has come about. He found that the energy our technology propagates is destructive of the evolutionary impulse in life forms, precipitating a downward spiral in the quality of organisms, and in the human quality of life. Imagine trying to be creative in a steel mill or a slaughterhouse! The pride we hold for our Machiavellian machines that pour out incessant noise and heat is based on the mistaken belief that we represent the summit of evolution.

Schauberger pointed out that, besides having the ego-centred need to control, modern science sees only the surface of things.¹ Its reductionist (everything in separate compartments) and materialistic agenda prevents an understanding of the energetic processes which, as Schauberger demonstrated, are essential for any material substance to come into being; in the same way that an idea or impulse must precede any human action. These subtle energies are essential to the increasing quality Nature demands in her evolutionary process. When these are subdued, only deterioration can result, which inevitably also affects human aspirations. So energy is cause, form is effect. An understanding of any creative process is impossible without true awareness of subtle energies.

Schauberger's worldview

Viktor Schauberger took the ancients' view of the Sun as the male inseminator of Earth to create bountiful Nature. But, also like the

ancients, he saw Nature as the mirror of the Divine. Following Goethe's eighteenth century view, he conceived of God as a kind of 'Divine Weaver' of the unfolding tapestry of Evolution. It was through this vision that Viktor found common ground also with the Austrian philosopher Rudolf Steiner.

However, he saw the Earth and Nature also as part of a much larger cosmos. The visible Sun is but the kernel, the only visible part, of a much larger sun that, with its radiative body, stretches to the very limits of the solar system. The Earth is within this sun, bathed by the solar wind, spiraling with its sister planets like organs within the same body. Our own bodies too are but kernels of a much broader, invisible self that extends around us, and with which we can feel another's energy.

He was influenced by Theosophical thinking that conceives the Universe as a holistic system, and criticized contemporary thinking that cannot accept our subservience to Nature; he said that this limitation of awareness prevents us accepting our place in the Universe, of which the consciousness we call Nature is a part. This holistic view of all creation is aided by the idea of a hierarchy of energies, from the very finest that are inconceivable to humans, down to the coarse, material energies which dominate contemporary society. Schauberger would refer to these different levels as 'octaves,' but we shall describe them as 'dimensions' or domains.

Why the mystery?

His scientific contemporaries misunderstood Viktor Schauberger because his frame of reference was the subtle energies in Nature, and they hadn't a clue what he was on about. His heightened sensitivities enabled him to be aware of phenomena more subtle than most of us are able to perceive. As this was his *modus operandi*, we need to take a look at this whole question of energies.

Firstly, we need to accept that the worldview of our contemporary culture is that of the material world; that is its reference point. We don't learn about energies at school or at college, other than the purely mechanical or electrical. Any phenomenon that is nonmaterial poses a difficulty for conventional science, for it cannot be described in a manner that is familiar to its discipline. Thoughts and emotions are energies we all experience, but how

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do we study them in the laboratory, other than their physical effects?

The various forms of effective energy medicine such as acupuncture, homeopathy, cranial osteopathy (and others) are not understood by orthodox medicine and, for that reason, are generally dismissed and usually opposed. It is not sufficient to see that acupuncture works; or that most people are intuitive. If you can't explain it, then modern knowledge says it must be bogus. We are not talking about religion, beliefs or values, but about things that actually happen on a nonmaterial level.

Earlier cultures acknowledged the tremendous power of immaterial life-energies. The life force (Ch'i) that moves along the energy meridians in the human body was recognized by the Chinese several thousand years ago. To correct bioenergetic imbalances or blockages in the body, they developed acupuncture at that time, a treatment still widely used in China and now also in many Western countries by accredited practitioners and by some more open-minded physicians.

While the life sciences, for the most part, are still imprisoned in the mechanistic view of life, the physical sciences are undergoing a revolution. The study of sub-atomic phenomena has led to the development of quantum physics, in which the environment becomes unpredictable. The boundaries between energy and matter become blurred, so that the smallest constituents of matter — particles and electrons — are interchangeable. Matter becomes energy, which leads to the conclusion that everything is energy.² Sadly the rigid boundaries that have developed between different scientific disciplines have as yet denied these insights to the life sciences and to medicine.

As there is nowhere intellectually respectable to slot in these 'anomalous' phenomena, new labels have to be found, like 'energy medicine' or 'alternative science.' Schauberger was a pioneer of alternative science, which pushes the boundaries of what is worthy of study beyond the merely physical.

Degrees of energy

We know the ways in which energy manifests itself. We can see that flowing water is energetic. We can see that energy is associated with creating clouds. Energy is active in an engine combusting gasoline

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or petrol. But what is its essence, a process that always seems to be connected with movement?

When we look up at the fluffy clouds on a summer's day, we may wonder what they're made of. So wispy and light, each cloud may contain hundreds or thousands of tons of tiny individual droplets of water, invisible and in constant motion. A collection of minute, invisible, weightless things becomes large and visible. It's a question of density. Our entire universe forms in the same way.

A material object consists of billions of atoms, each composed of sub-atomic particles, each of which is a vortex of energy. Gyrating around each other in vortices, the sub-atomic particles form heavier particles of energy that become denser, eventually slowing down to the point where they may become visible or even tangible.

Water is a substance that appears in different forms according to its compactness. In its solid state, as ice, its atomic particles move the most slowly. As the ice melts, they move faster, need more space to gyrate or vibrate, creating the less dense form, liquid water. Heated up, the particles accelerate, requiring more space, and become steam or the invisible gas, water vapour. Their state and appearance differ, depending on their expression of energy as movement or vibration, and its rate of motion is called its frequency. The principles of vibration and frequency determine the countless energy forms in our world.

The material substance we see is the result of energy setting up a visible 'blur' by vibrating in and out of a physical state, with a frequency and density that makes it seem like a static whole. The forms create an illusion of being solid and static, caused by countless particles constantly accelerating and then slowing down enough for us to see them as matter. When you see that all material objects are composed of atoms and particles in constant motion, it becomes possible to understand that everything is energy.

The vortex as the key to creative evolution

The vortex is a window between different qualities or levels of energy. Black Holes can be thought of as vortices linking different parts of our universe or even different universes. The vortex

and spiral became hallmarks for Viktor Schauberger, as for him they were the key to all creative movement. As we shall demonstrate later, the vortex is most clearly seen with water, which it uses to purify and energize itself, introducing finer energies to wipe clean the bad energies of the water's previous memory of misuse.

One could use the metaphor of a musty room that feels stale and unwelcoming. Once sunlight and fresh air are allowed to penetrate, the unpleasant atmosphere is quickly transformed. It is a natural law that the more refined energy always prevails over the coarser.³ As Viktor Schauberger demonstrated, Nature's evolutionary imperative is continually to refine and to create greater complexity and diversity, the vortex being the key process in this endeavour.

Energies as creative process

We normally think of energy as the power to do work, as to be able to run across a busy street. But thought is also energy. For the human, creativity is dependent on thought. Between having an idea and our wish to see it fulfilled lies a complex creative process.

If I want to make an apple pie, there is first the idea, then the planning, translating this through visualization and then finally the physical creation of the pie. This is much more important than we realize. From the simplest task like tying your shoelace, to the complex challenge of becoming a tennis champion, the better the 'mind pictures' of how we are going to perform the required actions, the more successful will be the outcome. The force, the impulse, which is the motivator for us to create, is an unseen energetic process.

Viktor Schauberger shows us that we need to think of energy in Nature as the potential for creation, not as a mechanical working process. He criticized our present view of how Nature works as untenably mechanistic, which he said this is one of the main reasons why we're in such a mess. Our culture thinks of Nature as being like a big machine that can be manipulated and its resources extracted for our own greed, rather than a creative system that has a purpose.

Productive energies make it possible for life forms to arise that are appropriate to the needs of the environment. It is as if Nature

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has a blueprint for what is required for a balanced and diversified community. For example, a healthy river that is carrying energized water will create on its banks trees that it needs to keep it cool and protect its vitality.

James Lovelock and Lynn Margulis recognized this creativity by naming the Earth 'Gaia' after the classical Earth goddess. They described how the Earth behaves like an organism, and how the conditions for life on our planet are maintained within very narrow limits, in spite of the enormous variation in the Sun's radiation, and the effect of harmful cosmic rays. This seems to work in a similar way to the self-regulating system in the human body that maintains the blood temperature in the narrow range essential for health (around +37°C/98.4°F). A mechanistic scientist would insist that this is just a computer function, but computers don't operate with purpose and meaning.

Spiritual science

To say that purpose and meaning are more to do with belief or religion is, I believe, a mistaken view. Purpose can be ascribed to living systems. Watch a community of bees at work, and there is a significant purpose! Meaning is usually associated with sentient beings. Being creatively human is difficult without a sense of meaning in one's life. Schauberger didn't talk much about God, but as we shall see he recognized in the extraordinary fecundity of Nature, and indeed in all of her processes, an indisputable sense of meaning and purpose. If it makes more sense to you, call it 'spiritual' science.

It is not necessary to postulate a God that created every living thing and who is behind all the subtle energies in Nature. Probably the idea, found in so many religions, of God as a being like superman whose support can be called on for your little or big power plays is in much the same category as that of regarding Earth's resources as private property for exploitation. The concept of co-creation — that all of creation participates in and contributes to the creative process, is often more acceptable to the thoughtful searcher.

We are clearly influenced by the beliefs of the culture into which we are born. The worldview of contemporary Western society represents an enormous shift away from what has been the norm of

human experience over its half million or so years on the Earth. The clearest modern examples of a more 'normal' worldview are the Buddhist beliefs, the Celtic, and those of the indigenous peoples worldwide who share the idea that the Great Spirit (or God) inspires and inhabits the rocks, the waters, and all living things.

In our detachment from the complete or 'real' world, we assume that it is normal to divide different 'bits' of knowledge into separate compartments or 'disciplines.' In fact it is quite abnormal. For traditional peoples, there are no barriers between cosmology, science and the spiritual, for in the interconnectedness of all Nature there is no separation; all is One.

Different dimensions

Viktor Schauburger didn't write about hierarchies of energy, but we know that he subscribed to Theosophical or Eastern concepts of energies, so we shall give an outline of these in order to understand where he was coming from.

Our physical spacetime dimension contains that spectrum of energy that vibrates at a rate low enough to support material form. This Third Dimension or domain has length, breadth and height, but it also has the three components by which humans may be conscious. These are: the physical, neutral energy through which the material world exists; the emotional, negative energy by which we receive sensory information; and the mental, positive energy by which we project our beliefs and personalities into the world. (NB: The terms negative and positive are used not in a qualitative sense, but more in the electrical sense of polarity.)

Our daily lives demonstrate the differences between these energies. The mental is the most changeable; it is harder to change our feelings, and the dense, physical form is almost impossible to change. If we move into a lower dimension, we lose one aspect of consciousness, and if we move higher, we gain one. Moving from the third to the second dimension, we lose the ability to generate original thought. Moving from the third to the fourth, we add the ability to mould time.⁴

In terms of the pure physicality of our three-dimensional world, our consciousness places and senses each lower dimension as being external to the body, although, paradoxically, it is both within and without, and permeated by the higher one (see Fig. 2.1, next page).⁵

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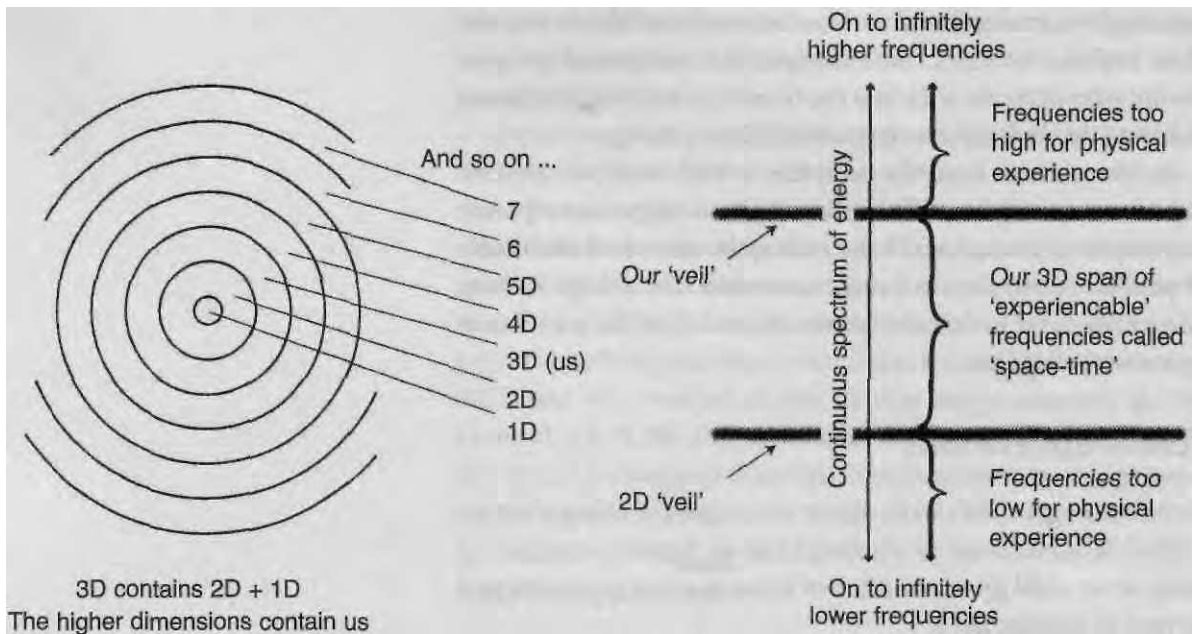


Fig. 2.1. Different dimensions or levels of existence.

Each dimension has a 'veil' at its upper limit which renders higher levels inaccessible. To a lesser extent someone of a 'lower' state of consciousness may be unaware of another in a 'higher state.'

Intuitive or inspired creativity, the level of expanded consciousness sometimes reached by inventors or by people of great vision, belongs to the fifth and sixth dimensions. It is apparent that Viktor Schauberger had the ability to tap into this reservoir of inspiration. All subtle dimensions are present on Earth, interpenetrating the third dimension, though we are not normally conscious of them.⁶ The other animals or humans with raised consciousness have a wider range of perception. A close relationship with a dog, cat or horse often reveals instances where the animal is aware of a nonphysical 'presence' which is beyond our own awareness or which may be a spirit presence. If we lower our consciousness, we feel less ability to control our own lives. If all our three components of consciousness are being fully used, then we can experience the full potential of being human, which is the gift of free will.

We shall not discuss in detail here the important energy shifts that are occurring on our planet at this time. In line with the idea that God, or the All-That-Is, seeks constant evolution or expansion of consciousness, ancient teaching has long predicted that the Earth and all its inhabitants would graduate from the third to the

fourth dimension in these times. Human society is becoming increasingly polarized between the materialist-based (third dimension) power structures that are reluctant to release their control, and those who wish to participate in a fairer and more spiritually based society.⁷

Changing octaves

When Viktor Schauberg said, 'We must think an octave higher,' (if we are to get out of this mess), one tends to think he means being less taken in by the physical view of life, and become more aware of its subtle aspects. While that is true, he did propose an interesting way of illustrating the concept of how a particular kind of energy can be taken up one octave. On the face of it, the following may be considered contradictory, but a more interesting view is to see them as complementary or reciprocal energies an octave apart, one a development of the other (like thesis and antithesis), which, when combined are reconciled and become a unity.⁸

lower octave		higher octave	
Matter	X	Spirit	= unity
Egoism	X	Altruism	(= unity)
Analysis	X	Synthesis	(= unity)
Heat	X	Cold	(= unity)
Gravitation	X	Levitation	(= unity)
Electricity	X	Magnetism	(= unity)
Bioelectricism	X	Biomagnetism	(= unity)
Pressure	X	Suction	(= unity)
Expansion	X	Impansion	(= unity)
Centrifugence	X	Centripetence	(= unity)
Oxygen	X	Carbones	(= unity)
Yang	X	Yin	(= unity)

The second column, the 'antitheses,' being more refined, have the potential to contribute to creative evolution by being able to bridge the gap between the idea and manifestation. They are, if you like, endowed with special vibrational energies and powers.

Callum Coats, in translating some of these more difficult concepts from Viktor's German terms, coined his own to describe the different forms of subtle energies from the fourth and fifth dimensions, which

2. DIFFERENT KINDS OF ENERGY

collectively he called 'ethericities.' By these he meant the bioelectric, biomagnetic, catalytic, high-frequency, vibratory, super-potent elements of quasi-material qualities:

These ethericities are further categorized as 'fructigens,' 'qualigens' and 'dynagens.' They respectively represent those subtle energies whose function is the enhancement of fruitfulness (fructigens), the generation of quality (qualigens) and the amplification of immaterial energy (dynagens). According to their function or location these may be female or male in nature. There are thus female fructigens and male dynagens, for example.⁹

We shall be using these terms from time to time where they are helpful.

3. The Attraction and Repulsion of Opposites

The Sun as a fertilizing entity

We all know that sexual reproduction requires insemination of the female by the male but, according to Viktor Schauberger, the Earth works on the same principle. From Nature's point of view, this starts with the Sun. Throughout nearly all of humanity's time on this planet, the Earth has been regarded a sacred being, the Great Mother. The Sun held an equally significant place in our forebears' worldview. Most of the ancient cultures regarded the Sun as the primary, masculine deity, fertilizing the Earth in order to create life. The eighteenth century thinker, Johann Wolfgang von Goethe referred to Earth's creative spirit as the 'Eternally Female' and the 'All-uplifting' (or levitating).

Viktor Schauberger uses explicit sexual terms to explain this vital natural process. He talks of the Sun impregnating Mother Earth in order to create the incalculable number of different life-forms that inhabit this planet. The Sun behaves very much as a living body. It is known to pulsate rhythmically, its surface expanding and contracting 3km (1.8 miles) every 160 minutes. Its life-giving energies warm the atmosphere and penetrate deep into the ground to inseminate the elements and substances of the Earth (the sleeping princess). The beneficial UVc rays¹ which the ozone layer allows through, have to decelerate in order to unite with the receptive and passive female energies rising inside the Earth; these slower energies have to accelerate, for fertilization can take place only if the two resonate with a sympathetic rate of vibration (see Chapter 4).

All of life, from the gross material to the ethereally subtle, evolves through the interaction of male and female, positive and negative, energies. Each polarity has a particular manner of expression, the downwardly-radiating solar energy meeting the Earth at right angles to the energies of the Earth ranged in a layer below the surface (see Fig. 3.1). Their properties and potentialities are opposite, but complementary, to each other. The manner in which these polarized energies

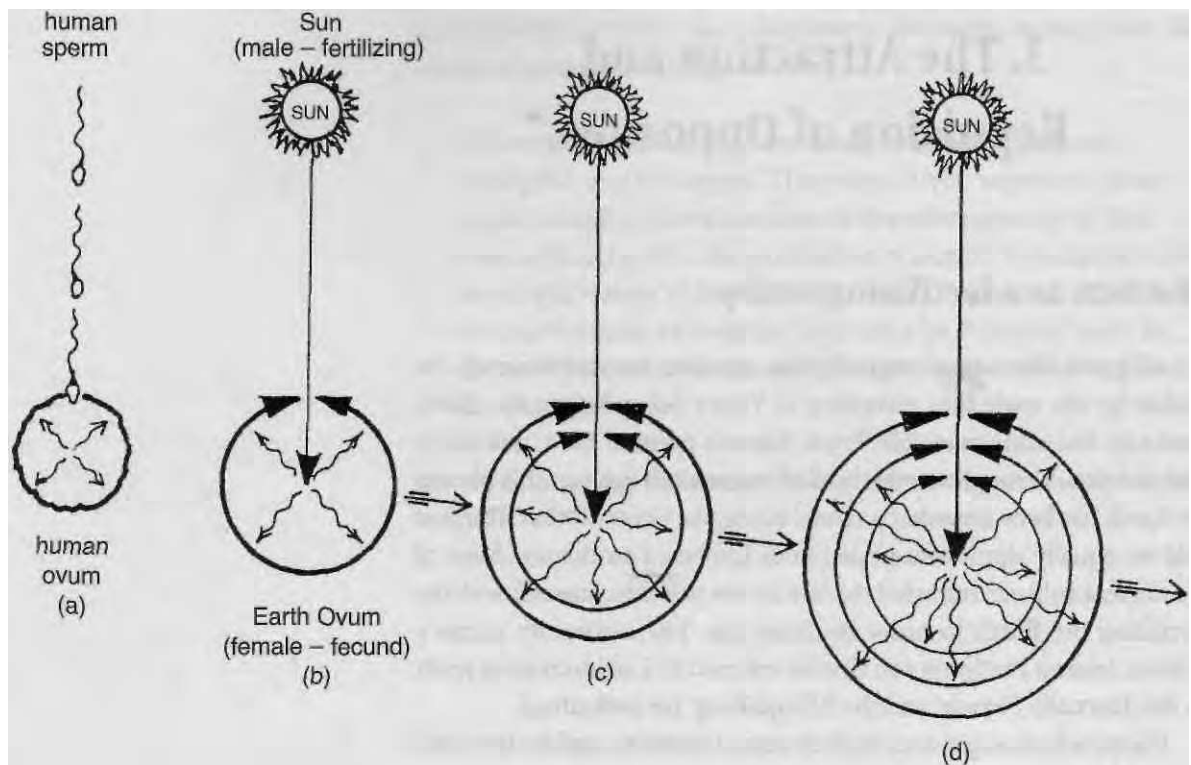


Fig. 3.1. Cosmic fertilization.
Schauberger saw the fertilization of Earth by the Sun as a similar process to human fertilization. The Earth responds to the Sun's energy by releasing propagating energies (the concentric circles) which become more developed and complex as evolution proceeds.

interact alternate between attraction and repulsion, which sets up a pulsation which will vary according to the season.

In winter when the Sun's energy has the most blue and ultraviolet light and the Earth is passive, with low temperatures in the cold winter sunlight, the vegetation is dormant and much animal life hibernates. It is then that fertilization, reproduction and growth are at a minimum, but the solar energies continue to penetrate deep into the Earth to awaken the embryonic female energies lying far below the surface. This union produces the prolific growth of springtime.

In spring and summer however, when the Sun's radiation becomes relatively stronger, the balance between the ultraviolet and the infrared shifts towards the red end of the spectrum. This awakens the Earth, whose energy interacts with the Sun's high-frequency energy, producing a third kind of energy, which is dynamic growth. Viktor Schauburger saw this as the discharged precipitates of higher, bipolar subtle energy. In the summer months the solar energies fuse with their female opposites in the higher strata near the

surface of the Earth. This repeated process of impregnation results in an almost continuous flow of fertile energies emanating from deep in the Earth to stimulate burgeoning growth.

Viktor grouped almost all the known elements and their compounds, with the exception of oxygen and hydrogen, under the general classification of 'female.' The exceptions were silver, zinc and silicon, which were considered to have paternally-oriented characteristics, while gold, copper and limestone were regarded as more maternal (these will be discussed in more detail in Chapter 17). Schauberger used the term 'carbone' for all these elements, (the extra 'e' meaning more than just 'carbon'), because of the prevalence of various sorts of carbonous matter in the multitude of living organisms created in the body of Mother Earth.

The Sun's energy, of course, is regarded as male, and Viktor saw oxygen as a lower form of solar energy. Together, the role of the Sun and its assistant oxygen is to fertilize these female, propagative energies, the Sun being responsible for all of life, and oxygen for organic growth and development. To hydrogen, Viktor gave a special role, as the carrier substance of both oxygen and carbone (see Fig. 3.2 above). From a detached view, far outside the atmosphere, our planet, composed of carbonous matter and fertilized by oxygen, is indeed floating in the hydrogen gas ocean of space.

The words 'matter' and 'material,' both have their root in the Latin word mater, meaning mother, which supports the idea that physical substance is feminine in nature. Thus all the physical elements (except for oxygen and hydrogen) can be seen as the maternal progenitive constituents of 'Mother-Earth.' Viktor Schauberger visualized all physical structures and all new living entities coming into being through the union between these 'mother-substances' and the inseminating agent of oxygen.

Polarities

Viktor Schauberger used to call polarity Nature's engine. He once described the harmonious interplay of the attraction and repulsion of polarized atoms as 'the dance of creation.' Electricity depends on the positive and negative charge of electrons. Magnetism expresses the polarities of attraction and repulsion. Polarities also apply in biological terms, of course, where balance is achieved between contrasting qualities, and of course between different sexes.

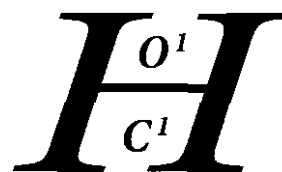


Fig. 3.2. Hydrogen symbol.
Hydrogen as the 'carrier' of both carbone and oxygen.

Without the attraction and repulsion of atoms there would be no water, no plants, nor chemical compounds. The mutual attraction of 2 x H and 1 x O gives birth to the marvel of water.

We are more familiar with the terms 'positive' and 'negative' than 'male' and 'female' in scientific contexts; as, for example, with electricity. Of course, positive and negative in this sense are not judgmental terms, but opposite poles. Schauberger felt that to use the terms masculine and feminine was more in keeping with Nature, which he saw as a living organic system.

Opposites working towards balance

We tend to think of Nature as being chaotic. The reverse is true. Schauberger discovered that Nature operates according to very strict laws. One of the most important is that concerned with the balance between energy polarities, each of which has its particular manner of expression. Masculine and feminine together make up a complete human being; one cannot exist without the other, and each needs the other to be whole. You might think that to be in balance, masculine and feminine energies need to be about 50/50, as they nearly are with the distribution of the human sexes.

For the last three thousand years or so human society has functioned in a predominantly masculine mode and is now quite out of balance. If you consider masculine energy to be represented by rationality, concern with the physical, forceful, expansive and individualistic; and the feminine by a tendency to be inclusive, intuitive, connecting and compassionate — then most will agree we need a swing of the pendulum towards the latter.

The natural law about balance is that it must be weighted towards the feminine for creative growth to proceed. Otherwise growth (in terms of higher quality) is arrested, and degeneration takes place. This applies to all the qualities, like:

matter and energy or spirit

chaos and order

yang and yin

positive and negative (not in judgmental terms, more electrical)

egoism and altruism

quantity and quality (a confusion of our present society)

And then in the more technical areas of life-building energies which we will cover in the relevant chapters:

gravitation and levitation
electricity and magnetism
oxygen and carbon
centrifugence and centripetence
negative temperature gradient and positive temperature gradient

What is the correct proportion by which the negative should dominate? Ancient Chinese society was very much taken up with these questions, and they believed the ratio of the correct balance was three-fifths (60%) to two-fifths (40%). Viktor Schauberg, who worked very intuitively, particularly on the temperature gradients in water, came up with two-thirds to one-third (66.7%). Callum Coats, who worked with Viktor's son Walter, a mathematician and physicist, related the proportion to the sacred geometric ratio of Φ (phi) which is 1.618, which gives the negative share of 61.8%.

The interaction and combination of opposites is found throughout all natural processes. It is true of heat and cold. The crucial interplay of heat and cold is found in many life-forms. Some types of fruit and seeds cannot germinate properly unless they have been exposed to frost. Brussels sprouts are best after the first frost! Growth is dependent on the right combination of heat and cold.

There is, however, no such thing as stable equilibrium, which would bring immobility and uniformity with which evolution would be impossible. Development and evolution in the dynamic Universe depend on an inherent imbalance, since movement is always occurring somewhere between one extreme and the other.

Gravity and levity

Gravity is recognized as a powerful physical force in the Cosmos. However, Viktor Schauberg demonstrated that its opposite, levity, is tremendously important in Nature. That levity is not acknowledged by conventional science presumably has to do with its being one of these more subtle energies which are anathema to the reductionist mindset. Without levitation, fish would have great difficulty swimming upstream in a strong current, and we would not have majestic trees reaching for the heavens; only ground-hugging

species.² Levitation force may indeed be related to these female subtle energies spiralling upwards to the Earth's surface in their desire for fertilization.

Levitation has much greater potential power than gravity, much as suction does over pressure. Schauburger used this to great effect in his implosion machines, as we shall see later. Levitation can best be described as the life-force present in all healthy living things, particularly the more youthful, which gives a feeling of lightness and of relative weightlessness. It gradually weakens with age, so that the elderly become conscious of the weight of their bodies and the greater difficulty of movement. When this levitational force withdraws, so too does the life-force of the body.

4. Nature's Patterns and Shapes

The essence of the Gaia principle is that all life is interconnected. Nature is a conscious system in which all phenomena or happenings affect everything in their environment — the micro-environment for a small incident, or the whole world in the case of a major event. Life forms in Nature respond to each other by means of resonance; you might call it 'Gaia's glue.' When you say someone has 'good' or 'bad vibes,' you're talking the language of resonance; flowers attracting insects by their colour and scent, our response to certain kinds of music, the practice of feng shui in the home; monks chanting, bees humming.

Resonance is the language of communication and response. It is how energetic information is transferred from one object to another. It is also the mechanism of harmony. For example, the organs and cells in the human body vibrate each at its specific frequency, and in the healthy body they resonate in harmony like the different instruments of an orchestra. Water, as the principal constituent of and the bringer of life to all organisms, is the most powerful carrier of resonance.

Sound as resonance

Every musician knows that a tuning fork of the note C struck in a concert hall will make any number of C tuning forks respond in the same space. When you rub your finger round the rim of a wine glass, its note will sound. If a singer finds this note, the glass will resonate in sympathy, or even shatter if the vibration becomes too strong.

Sound is probably the most ancient form of resonance in the human experience. Jericho was reputedly destroyed by destructive sound resonances. There are accounts in oral traditions of how early societies, such as the ancient Egyptian, the Tibetan and the Inca employed the use of sound to levitate enormous blocks of stone used in their buildings. Music itself is more than a paradigm of Nature's resonances. For millennia people have sung and played music to their crops, their lovers and their children. Schauberger

describes how the Alpine farmers while stirring the fertilizing liquid would sing into it (see p. 230).

Callum Coats cites:

Research carried out by Dr John Diamond in the field of behavioral kinesiology (BK), yields some interesting insights.¹ A member of the International Academy of Preventive Medicine, Dr Diamond found that while the deltoid muscle of a healthy adult male can normally resist a force of 40-45lbs, its strength is reduced to 10—15lbs through the negative effect of certain types of rock music, such as heavy metal and hard rock.²

In contrast to a more natural rhythm, where the beat emulates that of the heart, with emphasis on the first beat, i.e. DA-da-da or 'LUB dup rest,' as he puts it, in the above type of music this emphasis is reversed, i.e. da-da-DA, which conflicts with the body's natural pulsation and in poetry is known as an 'anapestic beat.' As Dr.Diamond states: 'one of the characteristics of the anapestic beat is that it is stopped at the end of each bar or measure. Rock music that has this weakening effect appears to have this stopped quality; it is as if the music stops and then has to start again, and the listener subconsciously "comes to a halt" at the end of each measure. The anapestic beat is the opposite of the dactylic or waltz like beat, which is DA-da-da, and in which there is an even flow.'³

Dr Diamond further asserts that:

these forms of music and unnatural rhythms cause switching in the brain's responses, which induces 'subtle perceptual difficulties' that may well manifest themselves in children as decreased performance in school, hyperactivity and restlessness; in adults as decreased work output, increased errors, general inefficiency, reduced decision-making capacity on the job,... in short, the loss of energy, for no apparent reason.

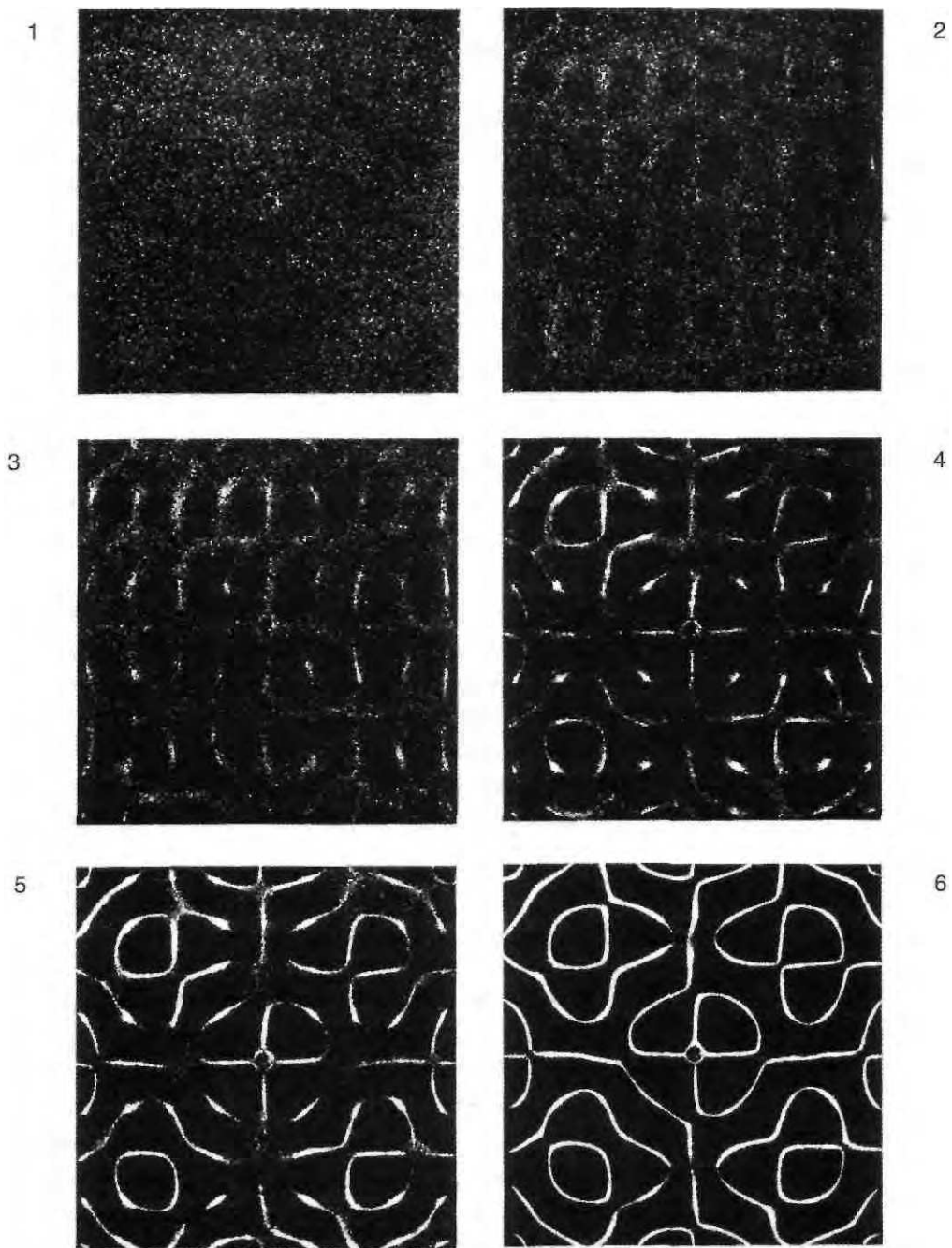


Fig. 4.1. Sonorous figure. The photographs show a simple sonorous figure taking shape under the action of crystal oscillators.
Steel plate 31 x 31 cm; thickness 0.5 mm; frequency 1560cps. The material scattered on the plate is calcined sand.

Thus a given physical structure is created by an idea dependent on a particular frequency level or pattern of vibrations or resonances, higher vibrations producing higher forms and vice versa.

As we survey the world around us today this is precisely what appears to be happening — the quantitative thrust of our technology and ideology is pressing downwards towards uniformity, to a vibrationless state, which is equivalent to zero energy and quality (see Fig. 5.1, p. 78). Thus species after species is disappearing simply because the prevailing creative energy pool available for qualitative evolution is absent. If we may imagine that all that can be preserved is what remains, we forget that Nature has her own urge to proceed with evolution.

What is required of us is to purge our technology's production of so much debased energy. This would create positive feedback into human consciousness, raising its level, which would produce an outflow of positive, creatively potentiated energy, creating a swing towards the negative or feminine in society (see Chapter 3, p. 52).

An urgent swing from carbon-based energy production to renewable sources is vital if global warming is gradually to level off. Schauberger believed that this would help restore the energy balance towards Nature's need for dynamic evolution. But it is not the whole answer; only a radical change of consciousness so that we recognize our sacred role as part of Nature and begin to follow her laws can bring about a new way ahead for Nature and the planet.

Resonance is about qualities

As we saw in Chapter 2, all matter, though it may look solid and stationary, is based on sub-atomic particles that are always in motion.⁴ The velocity of this motion determines its vibratory rate; this and the type and size of the object contribute to its vibrational frequency. A piece of wood, and each of the organs in our bodies have different resonant frequencies; planet Earth has its own — a frequency of 7.83Hz (Hertz). Every thing, both animate and apparently inanimate has its own vibrational or resonant frequency that can be enhanced by sympathetic vibrations, or harmed by destructive.

There is increasing evidence of the harmful effects on human

health from the ceaseless bombardment of the body's very sensitive, electrically charged cells by the veritable salad of electromagnetic emissions from high-tension cables, radio, television, radar, microwave transmitters, etc.

A very tragic example of this was publicized by the media in the summer of 2001.⁵ The navies of several countries, notably the US and Britain, have developed sonar technology for hunting submarines. This involves using massive blasts of sound up to 230 decibels which have been blamed for several mass killings and strandings of marine mammals, notably in the Bahamas in 2000 when at least seventeen Cuvier's beaked whales are known to have died.

Post mortem examination showed that sonar killed them through resonance, a process in which air bubbles in water can amplify sound waves by up to 25 times. When whales dive the air is forced out of their lungs into the tiny air spaces around the brain. Harmful resonance in these air spaces is believed to cause massive tissue damage and hemorrhaging, so that injuries can occur at much lower sound levels and over a much larger area than is presently acknowledged.

The rules that the US navy scientists follow are based on old-fashioned physical science which puts the safe noise level below 180 decibels, and the safe distance below 2.2 km (1.4 miles). There is now evidence that resonance effects could injure whales up to 100 km (62 miles) away.

Plants have perception and memory

Cleve Backster was a former CIA interrogator who trained police in the use of the polygraph, or lie detector. One of their techniques was the use of 'threat to wellbeing' to evoke emotionality in suspects. In a spontaneous experiment, he attached the electrodes of the instrument to a plant. In considering what a plant would regard as a threat, he thought of applying a burning match to a leaf. Without even moving, only his thought alone triggered a strong response in the plant.⁶

Subsequent experiments, which were then widely repeated by different researchers, showed that plants are able to communicate or 'resonate' their shocked or pleasurable experiences to one another. Backster describes how he tried to block whatever signals

4. NATURE'S PATTERNS AND SHAPES

were being passed between plants with a variety of complex screens, without success, suggesting that their signals are outside our electromagnetic spectrum. One of the hazards of this research is that unless the researcher is truly aware of his/her own emotional states, these can confuse the results. Perhaps every scientist who wishes to produce 'objective' results should go on a course to make him/her more aware of their prejudices! There is probably no such thing as truly objective research. (The same could be said for anyone whose work brings them into a role influential with others.)

Backster's best known experiment excluded the human factor. Live brine shrimps were dumped in boiling water automatically at pre-determined intervals, near the plants which reacted 'emotionally' each time the massacre took place. Not only do plants respond as if they had a nervous system, but they also exhibit a capacity for memory. As we shall see later, water also has this memory facility. With specially adapted equipment, 'emotional' reactions have also been monitored from amoebas, blood samples and cell cultures. Experimenting with fertilized eggs, it was found that when one egg was broken others, even in the next room, responded with shock.

Societies with ancient roots still celebrate this knowledge, as in the kosher quietening rituals, prior to the sacrifice of animals, or in the blessing of crops before they are harvested. This is more than consideration for the sacrifice, for it also recognizes that the food thereby retains higher vibrations and is more beneficial for human consumption.

Cymatics

One of the first to convert vibration into visible form was an eighteenth century German physicist, Ernst Chladni, who found he could influence patterns of sand scattered on a steel disc by playing different notes on a violin. This was developed last century by Hans Jenny of Zurich, using sophisticated equipment with liquids, plastics, metal filings and powders.⁷ He then vibrated the discs at ascending pitch, and found that the harmonic patterns that appeared at different pitches formed a variety of organic shapes: spirals of jellyfish turrets, concentric rings of tree growth, tortoiseshell patterns or zebra stripes, pentagonal stars of sea-urchins,

hexagonal cells of honeycombs, etc. The higher the frequency, the more complex the pattern. Jenny also produced a stunning film which shows that raising the pitch of sound caused a static pattern to change into a moving one.

All of these were, of course, the same geometric and vortical forms which underlie the ordering of physical matter; thus 'inorganic' matter vibrated simply with sound produces 'organic' shapes. But what is intriguing is that the sand collects on the 'dead' areas of the plate, for the 'life' of the pattern is vibrating on the background that is free of sand. The paradox is that the visible expression of energy is the inverse of the actual vibratory pattern, which is invisible. Organic growth and development require harmony. Resonance is the process by which harmony is brought to lower systems which then provide a firm basis upon which higher structures may be built.

One is reminded that the early Christian Gnostics insisted that the physical world is but a shadow or shell of a supreme ordering energy that exists in another dimension. Schauberger also saw the physical form like a discarded mantle or energetic detritus, the creative energy of the fifth dimension having been spent. Callum Coats saw the resonant pattern associated with a life form as the seed bearing the image or idea of what is to be created. He argued that all physical manifestation develops as the product of focused energy from the 'Will-to-create' or original 'Source.'

Patterns and shapes

Patterns are to do with order; with design and structure. Nothing can come into being without a design or template. The patterns in Nature are governed by laws that oral tradition tells were the gift of the gods (perhaps a rationalization of a chicken-and-egg situation!). Holistic or spiritual science sees Nature as a mirror of the original creative impulse in the Universe, a manifestation of the Universal Mind, or The-All-That-Is.

Our science, since the Renaissance, has been searching for immutable Laws that help to explain how the natural world works. Because the territory it observes is limited to the physical, conventional science rejects the idea of a cosmic order that affects the Earth and its inhabitants at a subtle energetic level, which frustrated Schauberger. He demonstrated that a new science that has more in common with ancient wisdom does show how the world

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is subservient to cosmic laws, creating 'correspondences' between the two orders.

Until comparatively recent times, scientists and philosophers recognized the creative energy of Nature as sacred. They saw the way in which Nature's patterns and its complex interdependences were so often expressed in very specific shapes and numbers as proof of God at work. So they called these correspondences sacred numbers and sacred geometry. It is certainly difficult to explain away the complex mathematical and symbolic patterns in Nature as purely accidental or fortuitous (see below, p. 66).

Patterns in motion

In the beginning was the vortex⁸

All life is motion. Natural movement is not in straight lines, but in spirals, or in spiraling vortices. Spirals are the actual shape of fluid energy evolving order from chaos. Viktor Schauberger saw them as the natural movement of life, from the structure of galaxies down to the atom. The spiral is the most common vehicle for 'correspondences' — as above, so below.

The spiral can develop in a number of different ways: as a vortex, moving upwards or downwards, round in a circle, or doubling back on itself. Whenever there is movement, spirals form, visibly with water; but gases and even electrical fields express themselves in spirals or doughnuts. Sinews, tissues, blood and bones and so many formations in organic life are spiral in form.⁹

Rhythms within the solar system

The relationship between Earth and Moon can be very subtle. Professor Frank Brown of Northwestern University has shown how the 'biological clocks' that initiate cyclical activities like rat-running, and colour change in fiddler crabs are subject to lunar rhythms. His better known experiment involved the shipment in hermetically sealed containers of oysters from the sea shore at New Haven, Connecticut to Evanston, Illinois, 2000 miles inland. Within a couple of weeks they had adjusted the conspicuous rhythm of opening and closing their shells to the lunar tides that would have existed at Evanston had it been on a sea coast.

The terrestrial environment is teeming with electromagnetic phenomena and their secondary effects, which are demonstrably related to greater events in outer space. Dr Harold Burr of Yale University kept extensive records of the voltage changes measured in holes bored in the trunks of trees. When both ends of a wire were inserted into two holes vertically a yard apart, an electrical current could be detected moving either up or down, at different voltages, in regular cycles that were not related to the Moon's phases, but to some other unidentified non-terrestrial source. His records showed that all trees, even hundreds of miles apart, would simultaneously experience the same changes of the voltage and direction of the current. It is as if the whole family of trees responds to the same electrical rhythm, like a cosmic breathing.¹⁰

It seems that there are universal laws, not yet fully understood, which guide an organism's growth into predetermined patterns. As the vehicle for creative energy, the spiral is clearly involved in the organic growth of plants and embryos. Buds contain all the concentrated energy of the future plant, and their mathematical analysis can yield clues as to how this formative energy is expressed. Rudolf Steiner, the founder of Anthroposophy, initiated these studies, which have been developed in great detail by the projective mathematician Lawrence Edwards.¹¹

Edwards discovered that tree buds expand and contract in a curious rhythm, specific to the species. He applied Steiner's theory that a species often has a particular connection to a planet. Steiner suggested correspondences between particular trees and flowers and certain planets, for example, the oak with Mars, and the beech with Saturn. The results clearly showed that these bud pulsations are linked to the cycles of particular planets. The Moon on its own had little effect, but when amplified by an alignment with Saturn (for the beech) and to Mars (in the case of the oak), showed unmistakable fortnightly rhythms. There was one beech tree studied that did not show these phenomena. It was found to be growing a few yards from an electricity supply substation!

The confrontation of two geometric systems

Schauberger was at odds with scientific rationalism. He described our prevailing Euclidean geometric system as 'techno-academic.' It

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is essentially a controlled, closed system whose elements are the point, the straight line, the circle and the ellipse. This system dominates the contemporary worldview and mindset and is incompatible with Nature.

In more traditional communities, the hard, straight lines of structures were often softened with decorative embellishments, such as are still found on the eaves or rooflines in some Alpine villages. In the last century, ornamentation has been stripped away in architectural design and we are left with buildings that present a naked angularity and sterile uniformity (of agricultural monoculture).

Until modern times the Chinese rejected the Euclidean model. Their building designs were informed by geomantic principles that recognized the straight line as the path of the dragon, the personification of destructive energy. This energy could be tamed by making it flow into curves and spirals. The Chinese understood in those days that straight lines fostered disruptive behaviour. Perhaps it is time to consider what a deadening effect the boxes we inhabit may have on our thoughts and emotions; of how our dependence on the straight line may cause us to behave.

Nature's system is non-Euclidean, open and dynamic; its elements are open spirals forms, shell, egg and vortical forms. This facilitates a fluid and adaptable environment, one in which forms are able to evolve into more complex and creative arrangements. Other creatures, whose sensitivity is nourished by the subtle energies of open forms, make use of roundness and curves in their nests, burrows, and shells. In order to arrest the downward spiral of our culture, we must take note of systems that encourage creative change (see Fig. 5.1, p. 78). Schauberger wished that we could remember that we were created as part of the organic processes of Nature, rather than the mechanical processes that we have adopted.

Sacred geometry

Viktor Schauberger saw patterns and rhythms as the heartbeat of the Universe, and was fascinated by the traditional use of the language of number and form to codify how they are repeated and in what form. It is hard for us, schooled in a rationalist worldview which separates form from the natural order to see that they are

part of one whole. The ancients regarded mathematics and geometry as the tools to understand patterns in Nature and in the Universe. The religious leaders of old, who were also the scientists and mathematicians, did not make our mistake of putting different phenomena in separate compartments. To them, the world of matter and reason and the world of spirit and the awareness of God were all one. In the context of myth and symbol, they used numbers and forms in a way that would satisfy the spiritual sense of meaning and the scientific need for structure and reason. Out of this process arose the traditions of numerology and sacred geometry.

In all the ancient cultures, the square symbolized the Earth of matter and rationalization, and the circle the encompassing world of spirit and feeling. How to bring them into balance was called 'squaring the circle' and was the pursuit both of architecture and philosophy. The sum of the sides of the square was equal to the circumference of the circle, so they come into harmony by enclosing the same area. This is sometimes used as a metaphor for the balanced personality. So 'circling the square' indicates someone whose rationality is greater than his/her sense of feeling.

As with other problems in sacred geometry, though it is not possible to draw this relationship by simple measurement, because it is part of the natural order, that is where the solution is to be found — in fact in the relationship of the size of the Moon to the size of the Earth.¹² You draw a square around the circle of the Earth (each side of which will equal the Earth's diameter). Then you draw the Moon on the same scale, sitting on top of the Earth. A circle with its centre as the centre of the Earth, and its circumference passing through the centre of the Moon will have a circumference equal to the sum of the sides of the square enclosing the Earth.

Fig. 4.2 also contains the 3-4-5 Pythagorean triangle which connects the corners of the Earth and Moon squares. It was from such relationships that the 'Pythagorean canon of proportions' was created. The basics of musical harmony depend on intervals created by these divine proportions. There were canons of architecture, of painting and of musical harmony taught in the medieval mystery schools, and partly revived in the Renaissance.

Fig. 4.2. Squaring the circle. Sacred geometry is based on observations of cosmic relationship. The Great Pyramid's base straddles the Earth's equatorial diameter; its apex is at the centre of the Moon, which is in true proportion to the Earth, and held to the square by a Pythagorean 3-4-5 right-angled triangle.

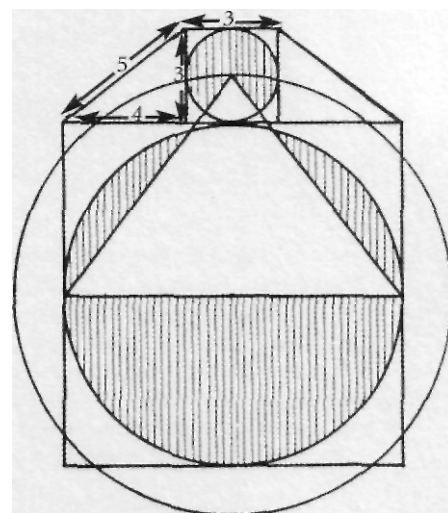
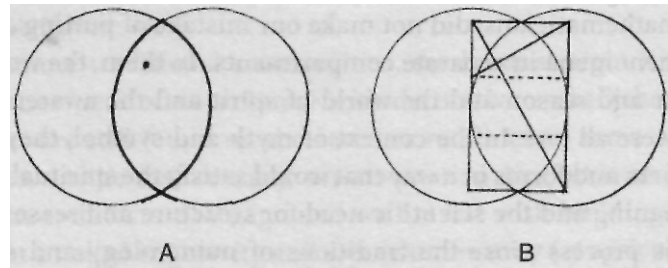


Fig. 4.3. Vesica piscis.

'The Vessel of the Fish' is the simplest and most informative geometrical symbol, being the orifice of two interpenetrating circles which inspired the master masons of the medieval cathedrals. Many Christian symbols, including the fish and the bishop's mitre, have been derived from the vesica. On the left is the fish, whose eye corresponds, on the right, to the geometric 'eye' of the $\sqrt{3}$ rectangle enclosing the vesica.



The golden mean

The search for perfect proportion, a shape for containment that is aesthetically pleasing, led to the discovery of the 'Golden Mean' or $\sqrt{3}$ rectangle. The square is too mechanical, a long rectangle too awkward. The shape that 'seems' to be just right is a square rectangle with the proportions 1:1.618. This turns out to be the magical proportion favoured by Nature in her designs. A series of these, reducing in size, form a perfect spiral, like the nautilus shell (Fig. 4.4).

Spiral forms often display a similar 'sacred' proportion of 1:1.618; numbers in the Fibonacci series, for example, which maintains the Golden mean proportions indefinitely, and dictates the beautiful spirals in a sunflower head, Nature's ingenious way of packing the maximum number of seeds into the head.¹³ An intriguing form that arises in Nature, either on its own, or as part of a more complex form, is the vesica piscis (Fig. 4.3). It is the feminine principle of generation from which spring all other geometrical forms, from triangles, squares, polygons, to Golden mean rectangles, which abound in sacred architecture.

All the traditional arts and sciences were based on the same cosmic truths expressed in number, and the sacred numbers were the ratios in a revealed world order, drawn from the experience of mystics and confirmed by precise measurements of the solar system. Sacred buildings from Stonehenge to the Temple of Solomon,

ancient Egyptian paintings, the works of Michelangelo, all have their magical effects and power over human consciousness attributed to the use of these divine proportions.

The Middle Ages were a time when the physical and the spiritual were completely intertwined, but our histories, based on the rational 'Enlightenment' worldview, regard those centuries as a time of ignorance and deprivation. In fact they were seething with creativity and inspiration: thus the Gothic cathedrals which relied more on an understanding of correct proportion than on reasoned engineering skills. Medieval musicians were fascinated that if you divided an open string by whole numbers, you can get notes that are in exact proportions.¹⁴ They rediscovered the miracles of harmony, and easily accepted them as Divine. This may be the reason for the extraordinary beauty of medieval chants.

The magic of the egg form

We noted in Chapter 1 that Viktor Schauberg was one of a breed of innovative natural scientists who are able to immerse themselves so deeply in direct perception of the natural world that concepts or theories spontaneously emerge. But his intuition also would bring up ideas directly. An example of this was his discovery that Nature

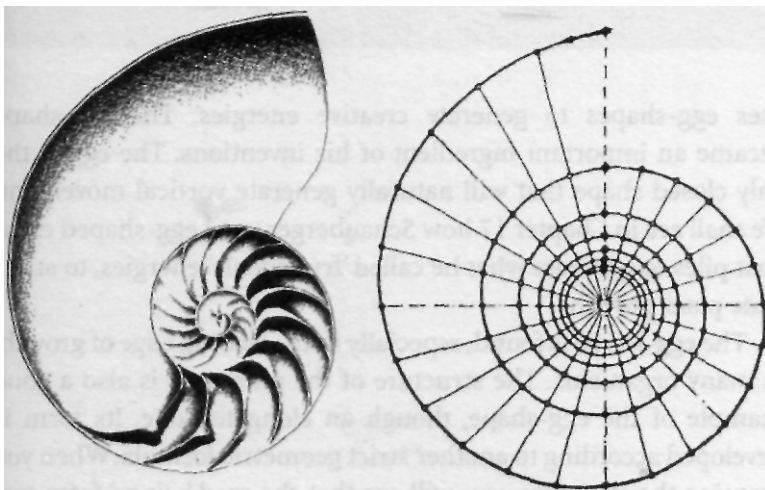


Fig. 4.4. Snail shell & hyperbolic spiral. The spiral of the snail compared to a similarly-shaped hyperbolic spiral (right), a non-Euclidean open system whose constantly changing curvature is based on very precise geometry.

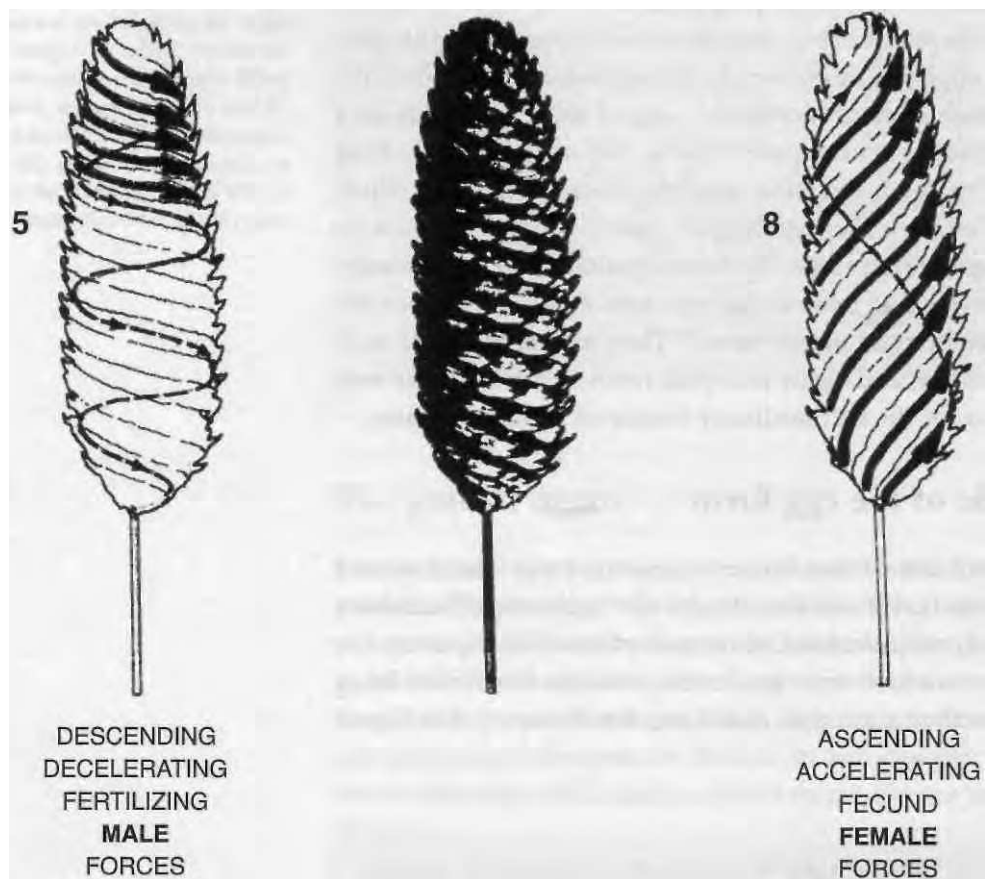


Fig. 4.5. Pine cone symmetry.

The left hand cone shows the five decelerating, positive male spirals of energy descending to meet the eight accelerating, rising negative female spirals. Where they cross each other, a union of the two forces produces a seed of new life. This illustrates how two antithetical, but oppositely charged forces can interact harmonically and be in balance.

uses egg-shapes to generate creative energies. The egg-shape became an important ingredient of his inventions. The egg is the only closed shape that will naturally generate vortical movement. We shall see in Chapter 17 how Schauburger used egg-shaped compost piles to generate what he called 'fructigenic' energies, to stimulate plant growth.

The egg-shape is found, especially in the leading edge of growth, in many organisms. The structure of the pine cone is also a good example of the egg-shape, though an elongated one. Its form is developed according to another strict geometric formula. When you examine the structure, you will see that the seed 'wings' form two opposing spirals. Moving from left to right (anti-clockwise) the

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descending (male) spirals complete three revolutions in the wavelength of the cone; the eight ascending (female) spirals, rising to meet the male, are slower moving, completing only one revolution in the cone's overall length. Where the male and female spirals intersect, a seed is born.

This relationship (proportion) of 5:8 is the signature of the 'Golden Section,' known also by the Greek letter phi (Φ), which resolves into the ratio 1:1.618033988. Phi — and pi (π), the transcendental number that describes the circumference of the circle, are called 'divine proportions.' Many of Nature's forms depend on phi for their generation, as it is one of the vehicles for transforming energy into form. By varying the length of the radii from the centre growth point (the radius length being determined by phi), a large variety of natural spirals and leaf shapes can be created.

PART TWO



How the World Works

5. Energy Production

The inefficiency of modern technology

Why are the accepted methods of producing energy so inefficient? Far more energy in terms of fuel must be applied than is produced, in most cases more than twice. This has up to now not been of concern, as fossil fuels have been regarded as unlimited and free for the taking, and still are by most, though there is more discussion now of sustainability. The main argument for reducing their use is that their consumption produces CO₂, the principal source of global warming.¹ A power source is now regarded as unsustainable unless, as for example with solar panels, it is renewable; it does not take from the Earth without giving back.

To compare the efficiency of modern technology with that of the human body is illuminating. Walter Schauberger (Viktor's son) calculated that a typical car on a journey of 1000 km (621 miles) consumes as much energy as a human being uses in a whole year. In an 11 hour journey, the car has consumed one human being's annual oxygen requirement. To replenish the oxygen consumed by the world's motor vehicles annually requires healthy forest covering 28% of the world's land area, far more forest than our present, and dwindling, forest cover.² There is alarming evidence that the amount of free oxygen in our atmosphere is actually reducing. This comes from an analysis of air captured in bubbles in ancient glaciers in Antarctica as well as in amber.

Using the famous Hasenohrl-Einstein equation $E=mc^2$, Walter Schauberger calculated that the amount of energy stored in 1 gram of material substance (e.g. flesh, wood, water) amounts to 25 million kWh.³ The challenge is how to unlock this source of energy. Viktor Schauberger once said: 'More energy is encapsulated in every drop of good spring water than an average power station is able to produce.'⁴

Schauberger observed that Nature's methods of producing energy were far more efficient, which led him to design implosion machines for natural energy production in the belief that they would solve the crisis of modern technology.

Entropy and ectropy

James Lovelock proposed in his Gaia hypothesis that Nature (for his mathematical model he used the name 'Daisyworld') regulates the Earth's energy balance through natural feedback mechanisms to suit the evolution of life forms. All energy used by living and non-living systems eventually degrades to irrecoverable waste heat, or disorder. All our physical processes lead to entropy. Nature made use of this to create the greenhouse effect, by which increasingly complex life forms were introduced into the biosphere as the climate was gradually modified.⁵

Entropy or disorder has been recycled by the Earth's greenhouse effect for millions of years. Every time we walk a pace forward, respiratory processes in the body burn a little ordered carbohydrate to power the muscles of our legs, and some disordered waste heat has been lost without trace from the surface of the body. Every time a simple bacterium moves a milli-millimetre it releases a few micro-calories of disordered heat waste. But every time a jet plane cuts its way through the stratosphere it leaves behind a massive amount of irrecoverable heat that disperses into the planetary heat sink in total disorder. It is all a question of degree. We are now increasing entropy to an unsustainable degree that is decimating life on the planet.

The Earth environment provides an extremely narrow temperature range compared to the extremes found in the Universe. Growth and development of life forms require moderate temperature conditions, as large or abrupt changes are harmful to most organisms. Our warped technology has made us used to very high temperatures; we produce power through combustion and hot fission. Most of our manufacturing processes require excessive heat and high pressure. We create chemical compounds using the coercion of heat and pressure. Technical man can indeed produce a high degree of order in one place, but in so doing he creates a much greater amount of disorder elsewhere.

Scientific 'laws'

Scientific laws are fairly reliable general statements about particular events under specific circumstances. The Second Law of Thermodynamics, for example, which states that all closed systems must

generate into chaos without input of energy to maintain the ordered state, is thought to be inviolable. Schauberger, by demonstrating that energy could arise spontaneously in his 'perpetual motion' machines, or that frictionless movement could be achieved, disproved this axiom.

Due to the remarkable feedback systems of the atmosphere and the biosphere, temperatures on Earth are kept within the narrow band of those required for abundant life, especially of higher life forms. Gaia research has shown that it is life itself which has fine-tuned that thermostat, so that more complex life forms are able to develop. Some species live within small microclimates, so that on one tree you can find several kinds of finch, each having its own niche.

Humanity is considered to be the most adaptable of species, able to survive in a range of about -10°C (14°F) to +40°C (104°F). While that is true for the species, it is not true for individuals, unless you believe that individual physical health and spiritual wellbeing are stronger than they have ever been. One of the requirements of Nature is that, in order to be whole, we have to be in tune with our environment. It takes many generations of adaptation to a specific environment for people to develop fine physical qualities and sensitive psychic faculties. Similarly it takes generations to adapt safely to a change in the environment (for instance, as a result of global warming or microwave radiation). In the past two hundred years our bodies have been challenged to adapt to higher temperatures and in the last sixty to stressful microwave energy.

Compare this to the efforts modern humans take to accommodate a life divorced from Nature, to jet travel life and unnatural food, and one subject to enormous electromagnetic stress. We take mountains of pills to counteract physical and emotional imbalances or go to psychotherapists to assuage our spiritual starvation. While he does not suggest returning to primitive life-styles, Schauberger assures us that, while our lives are now completely out of balance, by following Nature's clues we can regain both equilibrium and sanity.

Energy pollution

We usually think of pollution in physical terms, like a room full of tobacco smoke, or a factory's chemical effluent poisoning a stream. This is the boundary for conventional science. Thus when people

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raise fears about the safety of microwave ovens, radar transmission towers, mobile phones, the official response from scientists is inevitably, 'there's no evidence that they are any danger to health.' Naturally, cynical collusion between government and industry only strengthens this misguided view in order to discourage public protest or lawsuits.

Viktor Schauberger brought a further dimension to the concept of energy pollution. He understood that the creative process of Nature is consistently to refine, to diversify and produce higher forms of organic systems — to use a metaphor from human experience — to raise consciousness (consciousness as integration of higher levels of connectedness). He distinguished three forms in which subtle energies perform these upwardly evolutionary functions, which in the last chapter we called dynagens, fructigens and qualigens.

They are produced, as we shall see in the chapters that follow, through the specific forms of motion and temperature that Nature designed for the purpose of evolution. If I were in a court of law, it is these complex processes that I would cite as evidence for meaning, purpose and above all, intelligence in Nature. Schauberger described these 'enlightened' control systems thirty years before Jim Lovelock and his colleagues proposed the Gaia theory of intelligent self-sustainability in Nature, and in the area of evolutionary energies, went far ahead of them.

The blocking of these creative energies by the emanations from modern technological processes Schauberger saw as the most dangerous form of pollution. Their heat, pressure and, above all, chaotic effects actually destroy the more delicate energies of Nature's constructive developmental processes. Thus, chemicals invading a stream not only make it dirty and smelly, but they also destroy the complex structure of the water, so that it can no longer behave like healthy water, but literally dies (see Chapter 11).

This form of pollution has an evolutionary as well as a health effect on people. Schauberger suggested that this explained the well-documented degeneration of intelligence and the increase of violence in industrial communities. Dr Weston Price, studying fourteen isolated indigenous communities around the world in the early 1930s noted this in the effect that changing from their slowly evolved local diet to a western-type diet had on these people (for food is energy medicine!).⁶

We don't know how much energy pollution from anti-Nature technology affects the environment in general. Logically it should be most prevalent near power stations, large factories and the like. However, when rivers, which are the arteries of the blood of the Earth (see Chapter 11), and normally transmit energy to the surrounding countryside, are turned into 'lifeless corpses' (as Schauberger used to say), what effect will this cadaverous energy have on the environment? Clearly, if humanity is to reverse the downward devolutionary spiral, our first priority must be to change over to Nature's energy systems.

The choice before us

Humanity lived a relatively natural and sustainable lifestyle until fairly recent times. The growth of industry and its massive demand for energy resources has introduced increasing degrees of instability. Going back over 2000 years, but much more clearly in the last 350 years, it has been possible to chart a different kind of development which has brought with it a deterioration of the natural environment, increasing disorder and inefficiency.

Callum Coats shows this divergence of the two systems in the accompanying chart (Fig. 5.1). In the last 150 years with rapid industrialization, a scientifically based technology developed, and the divergence shown by the lower curve has become dramatic, with dire consequences for the environment.

By contrast, the curve rising up toward 'ectropy' shows how natural evolution builds more complex systems with more evolved species on the foundation of earlier ones. This is how biodiversity increases. The appearance of new species requires a surplus of evolutionary energies deriving from the improved conditions of interdependence. It is as though the growth in natural capital from the sound economy of evolution produces interest or surplus energy from which new life forms may be formed. Nature's system is so economical that little is wasted. The many seeds, nuts and fruits which sustain all the currently existing life forms, can be seen as the surplus on Nature's interest.

The mineral resources of the Earth, which are Nature's base capital, should never be used. As we shall see in Chapter 17, Schauberger illustrates how they are essential building blocks in the production of formative energies. The indigenous people understood their

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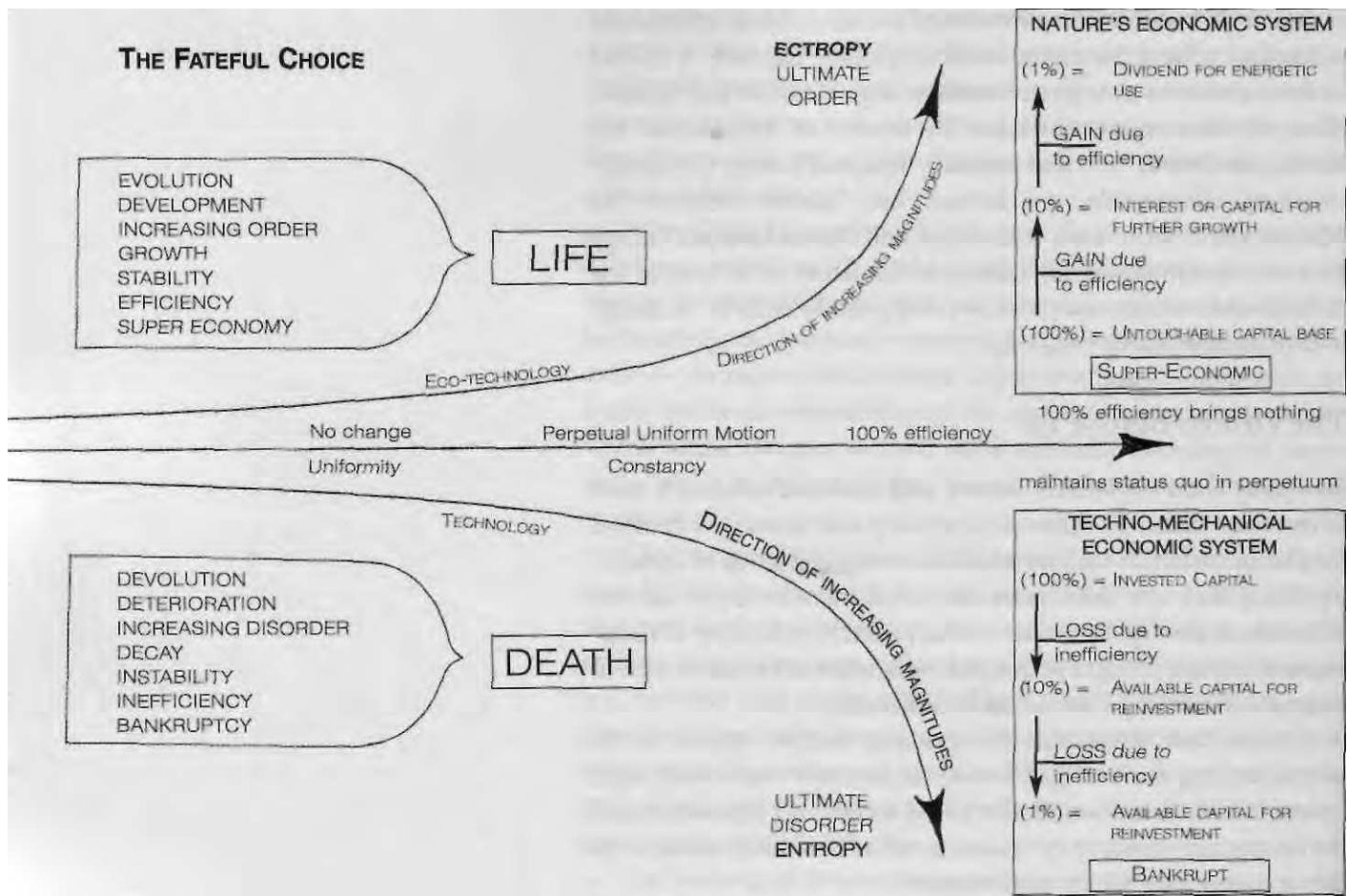


Fig. 5.1. The fateful choice.

importance. Mineral-rich lands are for them energy-enhanced areas that they regard as sacred.

Nature has to increase her capital by say 10%, to allow for growth, movement, and evolution of new life forms. To live sustainably is to live off Nature's surpluses (such as the careful harvesting of trees under properly controlled mixed forest management). The increasing diversity of evolving Nature brings more stability and the ability to withstand temporary setbacks (Fig. 5.1).

The centre line in Fig. 5.1 represents 100% efficiency. This may seem the best direction, but it is not the answer. It is undynamic, like circular motion. Its uniform condition means it never increases or decreases. Above all, the purpose of Nature is to seek movement, change and evolution; she despises stasis and uniformity.

The lower curve represents the path on which we are at this

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time. The use of energy is improvident and wasteful, replacing diversity with mass production for quick return, which Nature cannot tolerate. Where once rich forest flourished, with a wide diversity of interdependent species of trees and animals, there exist now only monocultures. This requires enormous, hedgeless fields where only one crop is grown, dependent on fertilizers that slowly destroy the living humus; they become monotonous environmental wastelands. Gone are the high yielding, organically nourished fields surrounded by windbreaking hedgerows teeming with birds, small animals and wildflowers. The frequently reported notices of endangered or newly extinct species bear witness to this ebbing biodiversity.

What Schauberger calls the 'techno-mechanical economic system' produces a downward curve, accelerating as unnatural systems of energy are applied more widely. Pollution apart, these systems are clearly inefficient. In the 1970s, Walter Schauberger discussed industrial efficiency with Dr Fritz Kortegast, head of research and development at Mercedes-Benz in Stuttgart, who confirmed that at that time the propulsive energy produced by their most sophisticated engines was only 13% of the total energy introduced, the balance consumed as dissipated heat and pollution. A business this inefficient would soon fail.

The truth is that our techno-mechanical economic system is created by vested interests that consume energy through the massive exploitation of non-renewable resources. It must be clear that the ultimately such unsustainable technology can produce only economic collapse, social chaos and environmental deterioration. The disorder and decay that we are witnessing come from our dependence on an energy system that is self-destructive. In this system, an investment of \$100 produces \$13, which in turn would produce only \$1.69.⁷

Energy defines quality

Convinced that we are the pinnacle of life on the Earth, we humans are actually destroying the very basis of creativity on the planet. It is the diversity of Nature that supports our place in the biosphere. The ongoing extraction of oil, coal and other minerals, deforestation, overfishing, and the continual loss of animal and plant species threaten our very existence. It is well accepted that only inferior

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kinds of fish can live in poor quality water. It is no different for people. By allowing the natural resources of the environment to depreciate, the quality of human potential inevitably suffers.

Conventional science does not understand the importance of quality. For the reductionist scientist water is water, or a genetically engineered crop is the 'substantial equivalent' of a conventional crop. No two things can be identical in Nature whose processes depend on constant change and transformation. While quantitative science states that $1 + 1$ makes 2, no two natural systems can ever be equated.

Monocultures and mass production mean repetition. They repeat an energetic or experiential process that has already happened, in which no new development, no advance, however slight, is possible. Identical repetition goes against evolution, because it wastes energy. The development of a new natural process or system demands change and variety.

George Gurdjieff, the Caucasian mystic and teacher, used to say that the ordinary person operates like a blind machine with no awareness or consciousness. Viktor Schauberger saw contemporary humans as superficial creatures that look, but never see. Our seeing is limited to recognition, not deep examination. We mistake outward appearance for totality, effect for cause. What we actually see are the external shells of manifestation, what is left by the formative energy. We don't see the energy that created the organism.

The creative energy-vortex

Callum Coats illustrates the process of the creation of matter in the diagram (Fig. 5.2). As we have seen, creative energy moves spirally in the form of a vortex. The creative process takes place as the energy containing the blueprint of what is being created moves in whatever way it needs to in order to create the system it wishes. It draws down matter as a mirror image of the idea or blueprint. This is why the physical is said to be the shell of the organic reality.

What we have described is the formative energy. There is also the sustaining energy, the Ch'i in Chinese terms, which moves in the same way. This is the way a healthy river moves; and the blood in our capillaries, external manifestations of an energy path. We

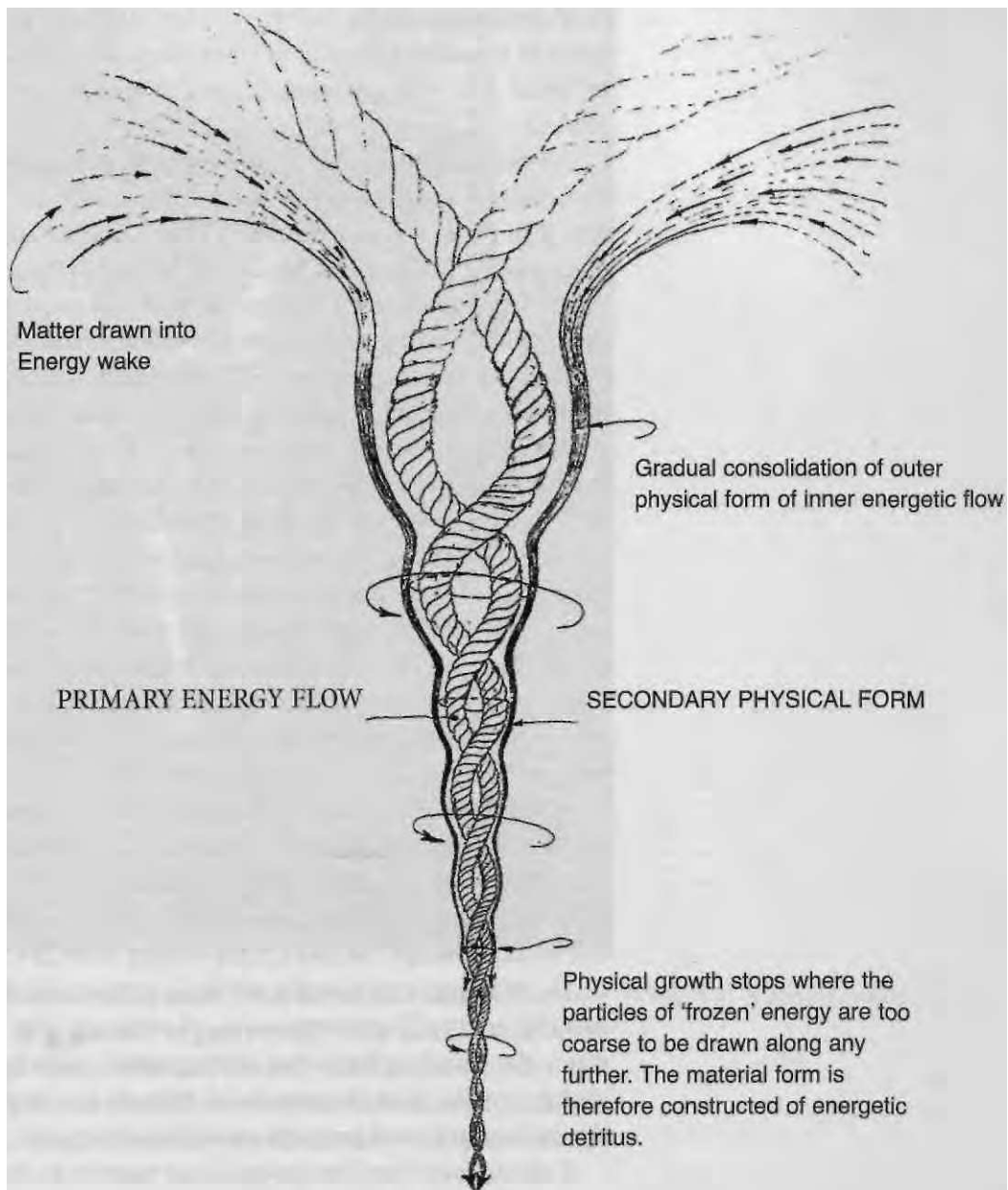


Fig. 5.2. Energy and form.

In the beginning was energy; it is primary — the cause; it creates the form in which it wishes to move; the form is the mirror of the energy — the secondary effect.

see the blood, but we don't see the energy that pushes it. What is visible in blood is the matter that is too coarse to be taken to the final destination of the energy. Energy manifests how it wants to move in the most efficient way. It is as if, when we build a house, we build it to suit our lifestyle, one in which it is easy to move around.

All natural systems are mirrors of their pattern of energy, or of the 'idea' that sought to create them in the first place. When the system is in place, the energy from which it originated is rejected as matter being too coarse to be carried further in the energy stream. Viktor Schauberger used to describe the Earth as a huge dung-heap, saying that all living things were the result of waste matter ejected by the creative energies moving in a certain way, and which were unable to continue transporting the material further.

Put simply, it is only those energies that remain immaterial that contribute to an increase in life-force, while the remaining energetic material is expelled as waste, just like daily human defecation. There are subtle nonmaterial energies in the food we eat, which are used to produce thought processes and metabolic functions. The human body is like a energy path containing a complex vortex which transforms the energy of matter into intellectual and physical actions. It is therefore axiomatic that the quality of our functions is dependent on the quality of the energy that we ingest. Viktor Schauberger campaigned for high quality nutrition and water.

So, physical manifestation depends on the movement of energy. All of Nature's creations that we observe are the outward shell of the formative energy path. Schauberger used to say that a tree will grow only to the height to which the energies can draw up the physical mass, although the tree's main energy body lies above it.

He demonstrated that the vortex is the natural form of movement for energy. The accompanying photograph (Fig. 5.3) well illustrates the spiraling form that water prefers. Each of the twists is slightly smaller than the one above. Viktor's son, Walter, calculated the mathematics and proportions of this structure.⁸

Callum Coats used the action of our weather to demonstrate the importance of the vortex in creating material substance. The spiraling air masses possess very little density, very slow rotational velocities and a large radius of influence. When these air masses converge, they gain in speed with the reduction in their radius of rotation.

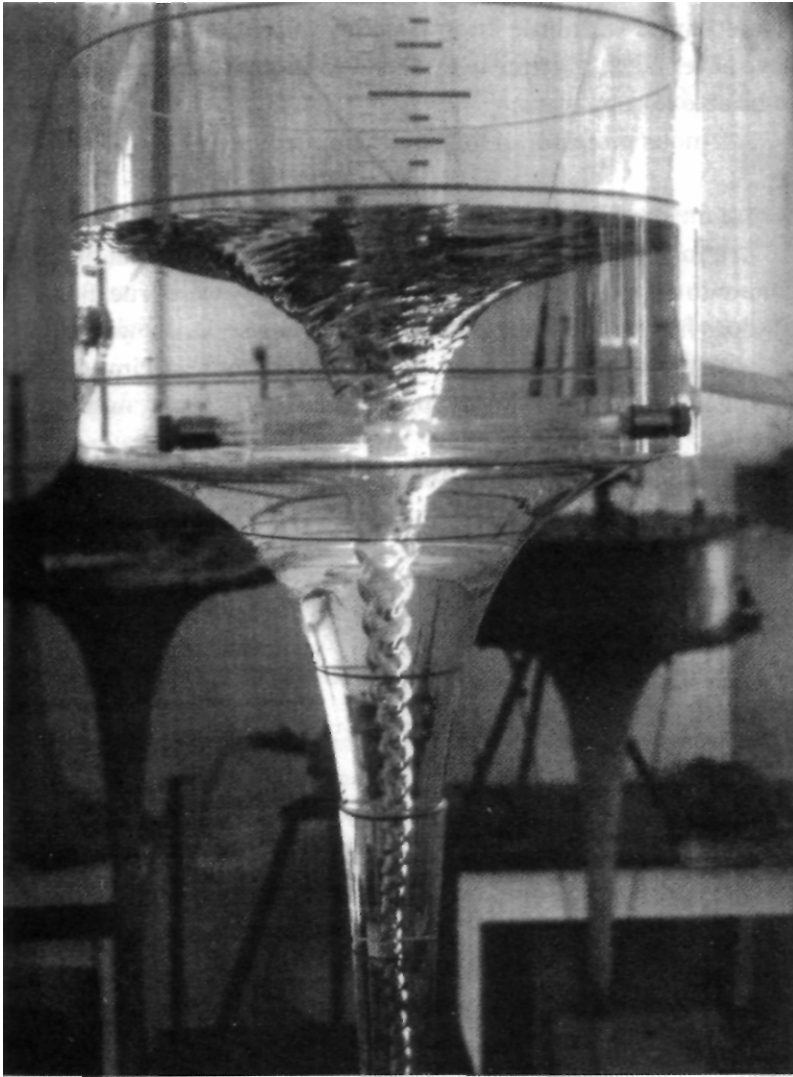


Fig. 5.3. A natural vortex.

At their extreme development, these air masses take on the more physical form of a tornado or waterspout. With their source in the lower density air mass subjected to solar radiation, as they descend with increasing velocity they become denser and more physical. The core of some tornados becomes so dense they can bend railway lines.

Viktor Schauberger found it hard to understand why science has not ascribed any fundamental importance to the natural movement of energy and Nature's systems of spiral movement, which are so clear, from the scale of a galaxy to that of a DNA molecule. Perhaps this is because it has been too immersed in the Euclidean elements

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of mechanics with little knowledge or conception of organics. We have never taken the time to understand enough Nature's dynamics to be able to copy them.

A famous professor of logic once pointed out:

We must conclude, I think, that there is no room for telepathy in a materialistic universe. Telepathy is something that ought not to happen at all, if the materialist theory were true. But it does happen. So there must be something seriously wrong with the materialist theory, however numerous and imposing the normal facts which support it may be.⁹

Goethe too said of scientists, 'Whatever you cannot calculate you do not think is real.'

6. Motion — the Key to Balance

What we are doing is wrong and contrary to Nature. Nature moves in other ways. She primarily employs drawing (i.e. sucking), energies, since these are indispensable to Nature for the growth and maintenance of life. Nature uses pressure energies and explosive forces only for reducing quality and destruction. The work of atomic physicists is also upside down. They would be more correct if they started with simple nuclear fusion. They should set about the cold transformation of hydrogen into helium, as Nature has done over the millions of years of Creation. Today's technology has a tiger by the tail, because it splits the heaviest atoms with the greatest development of heat and an enormous expenditure of energy.¹

We use the wrong form of motion

The way earth, water and air are moved determines whether pathogenic or healthy life-forms come into being. New life can arise from burnt (carbonized) bacterial cultures, but if it is wrongly moved and processed then its parasitic nature soon becomes evident. However, if this culture is placed in soil that has been spared humanity's misguided interference, then its life-force blossoms again immediately.²

Motion and energy are inextricably interlinked. Movement is an expression of energy, and together with temperature, these are the cornerstones of Schauberger's Eco-technology. Through his careful observations and experiments he became aware of the difference between Nature's way of working and the prevailing human technology. He realized that the principles under which conventional technology operates must be basically unsound to have produced such appalling consequences for water, for soil and indeed for all of life.

Most of us are aware of the effects of chemicals in the body and on the soil, of the dangers of radioactive waste and biotechnology. But Schauberger was also concerned with something much more basically wrong with our technology. Being above all a practical man, he observed the appalling squandering of resources; why are

the internal combustion and steam engines on which our civilization depend not even 50% efficient? The energy that is not turned into power or motion is wasted and heats up the atmosphere, adding to the greenhouse effect. From his observations of Nature came the answer, which is probably the most important of Schauberger's discoveries — that we use the wrong form of motion.

Our machines and technological processes channel agents such as air, water and other liquids and gases into the type of motion that Nature uses only to decompose and dissolve matter. As a consequence, the air, water and other substances are devitalized and debilitated, affecting their surroundings. The energy produced by our technology is harmful because, by its very nature, it causes deterioration in the environment through strengthening those energies that break down structures and degrade quality, while at the same time suppressing those that increase quality and thus help plants and animals to be healthy.

Biodynamic and organic gardeners have commented that they value Viktor Schauberger's advice on how to treat materials that Nature breaks down for recycling, for these insights have been lacking for this form of cultivation (see Chapter 17 for more on this topic).

Through its dependence on the decomposing mode of motion our technology is dangerously affecting the vital biodiversity and balance of our ecosystems, the stability of our societies, and is one of the main causes of human-generated global warming. The form of motion on which we depend for building and development is the one that Nature uses to destabilize and break down. Nature uses another form of motion for creating and rebuilding. It is hardly surprising then, that our technology is self-destructive and unsustainable.

Our mechanical, technological systems of motion are based on explosive, outward pushing energies which always meet resistance, producing heat and friction. This form of movement goes out at a tangent, producing the fastest movement at the periphery (as in a wheel), a form of motion that is disintegrative, noisy and inefficient, because so much of the energy is dissipated. The effect is to break apart, to fragment. This is the way we generate our power; from the inside to the outside. It is called centrifugal movement, and is a process that Nature will use only to break down before reassembly into some other form takes place (see Fig. 1.2, p. 33).

By contrast, Nature uses the opposite, centripetal, form of

motion, moving from the outside to the inside with increasing velocity, which acts to cool, to condense, to structure; like water going down a plughole. When we talk of something imploding on itself, there is not the resistance or dissipation of energy that is found in the explosive process. The reverse takes place, cooling and condensing. Schauberger called this 'constructive' movement.

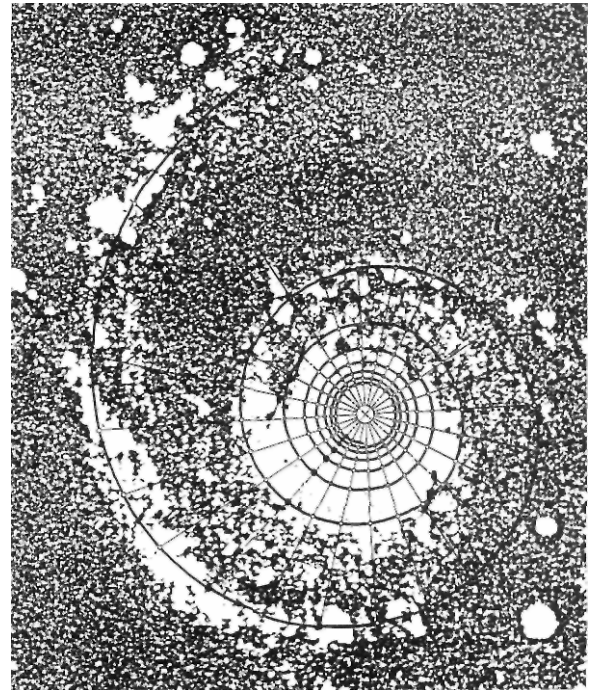
The centrifugal form of movement should not be called 'destructive,' because the word has such a negative connotation, and it has its rightful purpose in Nature; instead he called it 'deconstructive.' Viktor Schauberger demonstrated with his remarkable implosion machines that replicated the in-winding motion of Nature, that this was the way to create energy for human needs in the future.

As Schauberger's discovery has such enormous implications for the future of human culture, why has it not been openly debated in scientific circles? The reasons are two-fold. Firstly, Schauberger, being persona non grata with the German postwar establishment, was not granted the oxygen of publicity. Secondly, he was talked of in postwar Germany as a Nazi collaborator, by association rather than fact, as his work for the Nazi regime was carried out under duress. Though both the Russians and the Americans secretly confiscated his research papers, the Cold War days kept his name in the shadows. His discoveries have been enthusiastically embraced by the alternative culture, but as yet have not become more widely known.

The 'original' motion

Viktor Schauberger was always comparing terrestrial laws of motion to the patterns of movement in the Heavens. He firmly believed that there existed a 'form originating' motion that was responsible for the evolutionary dynamics of the Earth and the Cosmos, generally referring to it as the 'original' motion. The whole Universe is continually in motion. This movement is in spirals, many spirals within spirals. Galaxies take a spiral form. As we saw in Chapter 4, forms in Nature very often follow the law 'As Above, so Below,' implying that there is a Universal language of form and motion. Liquids and gases prefer to move in spirals; likewise energy. Dowsers find energy spirals in the ground. Energy in the human body seems to do the same.

Fig. 6.1. Spiral galaxy superimposed by hyperbolic spiral.³



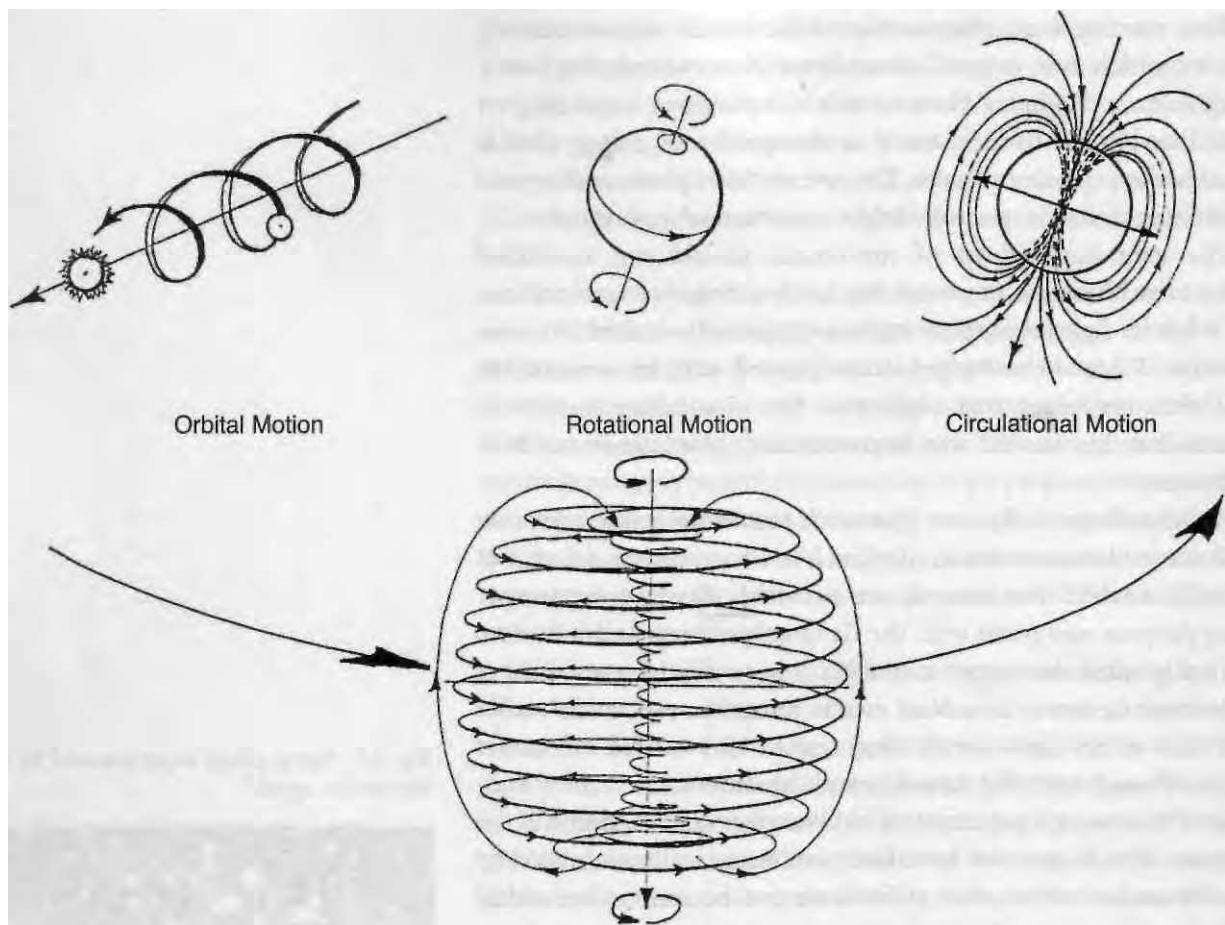


Fig. 6.2. Three basic forms of motion. When combined into one, these make up the dynamic, creative, formative spiral-vortical movement.⁵

As Callum Coats recounts:

There are many examples in ordinary language which recall this spiral movement. When we ex-(s)pire, we leave this our 'mortal coil.' When we are in-spire-d, we feel drawn to higher ideals. Our spir(e)it is raised when we are sucked into the upward spiral. Similarly through re-spir(e)-ation the ionization balance of the body, which varies according to the time of day, is adjusted by the proportional ionization of the air indrawn through the nostrils, which due to opposite directions of rotation, is negatively ionized by the left nostril and positively by the right nostril. Sneezing, therefore, may perhaps be a compensating process, through which high opposing charges resulting from over-ionization are reduced to zero.

Interestingly, the German word — Wirbelsaule — for the spinal column, the fundamental supporting structure of the human body, literally means a 'spiral' column. Similarly each of the vertebrae is referred to as a whirlpool or vortex. Clearly the Germans have long had a completely different view of the central structure of our bodies. Whereas we see it as a stiff, more or less rigid, physical structure, they understand it more as an energy path. This has obvious associations with the Hindu concept of Kundalini, the name given to the two serpents that metaphorically dwell at the base of the spine, whose rising energizes that spiritualize the various higher chakras (energy vortices) of the physical body and whose entwining on Mercury's staff (the caduceus) empowers him as Messenger of the Gods. Nature too, provides us with countless examples of dynamic spiral growth and movement in the form of galaxies, cyclones, whirlpools and tornadoes, of which we, in our blindness and arrogance, fail to take note in our pursuit of mechanical perfection.⁴

Types of motion

All natural dynamic motion consists of one or more of three basic types of movement — orbital, rotational and circulatory (see Fig. 6.3). When these are put together they produce a complex form we call spiral-vortical motion which Nature uses to build, structure and purify.

Viktor distinguished two forms of spiral-vortical motion — radial—> axial (or centripetal) and axial—> radial (or centrifugal) motion. In Fig. 1.2, axial —> radial motion is shown initially as a movement around a centre, changing to a tangential movement as it moves outward. There is no motion at the centre but, with increasing distance from the centre, the speed of movement and the degree of disintegration also increase. The wooden wagon-wheels of yore had an iron band around them for this reason. The 'tie-er' (tyre or tire) held the wheel together.

The form of movement employed by our technology produces excess energy in the form of heat or noise. Initially, with no movement at the centre, velocity and resistance increase with the outward 'explosion.' This axial -> radial centrifugal form of motion can

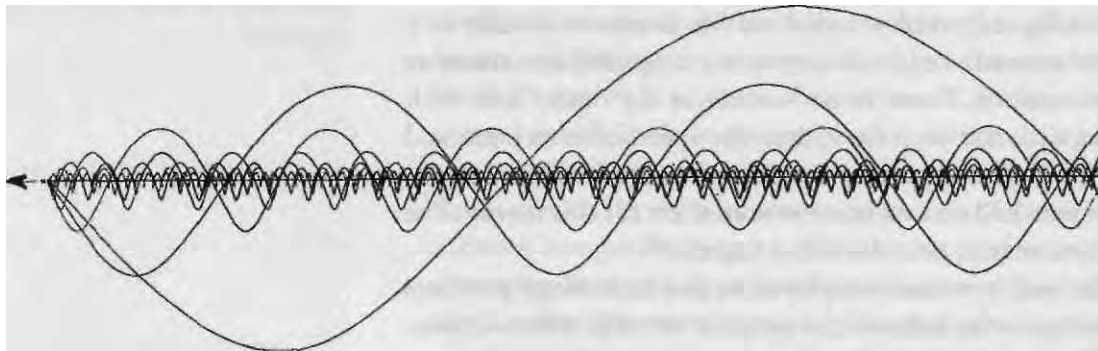
be described as divergent, decelerating, dissipating, structure-loosening, disintegrating, destructive and friction-inducing.

While the explosive dispersion of energy creates noise, its creative concentration of energy, is silent. As Viktor often insisted, 'Everything that is natural is silent, simple and cheap.' A natural forest can be a haven of silence. The millions of chemical and atomic movements and interactions taking place are energetic processes, an extraordinary concentration of quiet creative energy. In contrast, its destruction brings the horrendous racket of chain-saws, heavy machinery and crashing trees. Our mechanical forms of movement are almost always axial \rightarrow radial and heat- and friction-inducing. Nature's dynamic processes, on the other hand, use the opposite form of movement, the slowest at the periphery and the fastest at the centre. The movements of a cyclone or a tornado are a good example, flowing from the outside inwards with increasing velocity, which acts to cool, to condense, to structure. The centre of a cyclone is not hot; it is cool.

Radial \rightarrow axial (centripetal) motion can be defined as convergent, contracting, consolidating, creative, integrating, formative, friction reducing.⁶ The dynamics of evolution must therefore follow this centripetal path, for if the opposite were the case, all would have come to a stop almost before it started.

Force is the employment of energy to do work, and can be measured as acceleration. It is important to distinguish between two forms of acceleration, for one form breaks apart and the other consolidates. In the deconstructive form the radius of rotation is expanding and the form of acceleration is pressure- and friction-

Fig. 6.3. The planetary vortex.
The movements of the inner planets, shown dynamically over a period of one full Saturn cycle of 29.46 years, actually describe a vortex, with each planet describing its own spiral path about the Sun.



intensifying (centrifugal acceleration); the constructive when the radius of rotation is reducing, creating a form of acceleration that is suction-increasing and friction-reducing (centripetal acceleration). More power must be applied to maintain the same velocity or to increase speed with centrifugal acceleration. With centripetal acceleration, the velocity and energy increase automatically. Viktor called this 'formative force,' the constructive energies from which all life is created.

7. The Atmosphere and Electricity

It is thought that, when the Earth was young, after it had cooled from a molten mass of condensing gases and a crust had formed, it was entirely covered in water. In those early days there was great heat loss and the Earth was cooler. The lower part of the initial atmosphere was composed of water vapour evaporated from the vast ocean, with a contribution of other gases emanating from volcanic eruptions. Because of its high specific heat¹ and its capacity to retain heat, the water vapour gradually absorbed the heat of the Sun, thus raising the average temperature. Heat losses were kept to a minimum at night because water absorbs infrared heat. It was these qualities of water that allowed the greenhouse effect to take hold. Otherwise the Earth would have remained cold, lifeless and barren.

Of all liquids, water has the greatest ability to store heat. It absorbs heat slowly, releasing it slowly. Water vapour was thus an ideal medium for conserving heat on the Earth's surface, enabling life to gain hold and, once it was established, water became the medium for complex life forms to develop.

What makes water different from all other liquids is its so-called 'anomaly point' or 'point of anomalous expansion,' which will be discussed in more detail in Chapter 9. Contrary to the behaviour of other liquids, the volume of water does not decrease continually with increasing cold; below a temperature of +4°C (39°F) it starts to expand again, and on freezing expands still further.

Pure water will freeze only at a temperature of around -40°C (-40°F) or in clouds at about -10°C (14°F), which again is fairly important, as we shall discover later. Compared to absolute zero (-273.15°C), supposedly the lowest temperature found in the Universe, the temperature of 0°C (32°F), or freezing point, is relatively warm. The normal human living environment, between approximately -10°C (14°F) and +40°C (104°F), is not a large range.

At a height of about 22 km (14 miles) above the Earth's surface, water vapour becomes so thin and unsubstantial that it is dissociated into its constituent atoms of oxygen and hydrogen through the action of strong ultraviolet radiation. As it is the heavier element,

the oxygen then sinks back to Earth, while the lighter hydrogen atoms rise eventually to reunite with the hydrogen of space.

The widowed single atom oxygen atoms are now exposed to high levels of ionizing radiation which causes them to combine with molecular oxygen (O₂) to form an allotropic form of oxygen, O₃ or ozone, which absorbs dangerous ultraviolet radiation, a process vital for shielding life on Earth.

Earth's atmosphere

The atmosphere is a relatively thin veneer surrounding the Earth, containing the gases essential to life. Its total thickness is about 400 km (248 miles), which represents about 0.3% of the Earth's diameter. It has four principal zones, through which the temperature swings alternately from a falling mode to a rising mode:²

During each of these temperature transitions, the anomaly point of 4°C (+39°F) is passed, so that in each zone there is first a band of negative temperature gradient, followed by a band of positive temperature gradient (see Chapter 5). The three lower zones each have a water layer close to these anomaly points, cumulus and cirrus clouds (troposphere), nacreous clouds (stratosphere) and noctilucent clouds (mesosphere) as shown on Fig. 7.1 which would resist the transfer of an electric charge. Callum Coats has suggested that this could result in the creation of a natural biocondenser, a condenser being a device with which an electric charge can be accumulated and stored.

Table 1. The four principal zones of the Earth's atmosphere.

	height (km/miles)	temperature	
Troposphere:	13/0 to 8	+ 15°C (59°F) to -60°C (-76°F)	area of weather activity
+4°C (39°F) layer	3.5/2		and the greenhouse effect
Stratosphere:	13/8 to 50/31	-60°C (-76°F) to +10°C (50°F)	contains ozone layer
+4°C (39°F) layer	40/25		and very high clouds
Mesosphere:	50/31 to 80/50	+10°C (50°F) to -100°C (-148°F)	rapidly falling temperature
+4°C (39°F) layer	65/40		and pressure
Ionosphere:	80/50 to 400/248	-100°C (-148°F) to +600°C(+1100°F)	absorbs Sun's shortwave
+4°C (39°F) layer	100/62		radiation

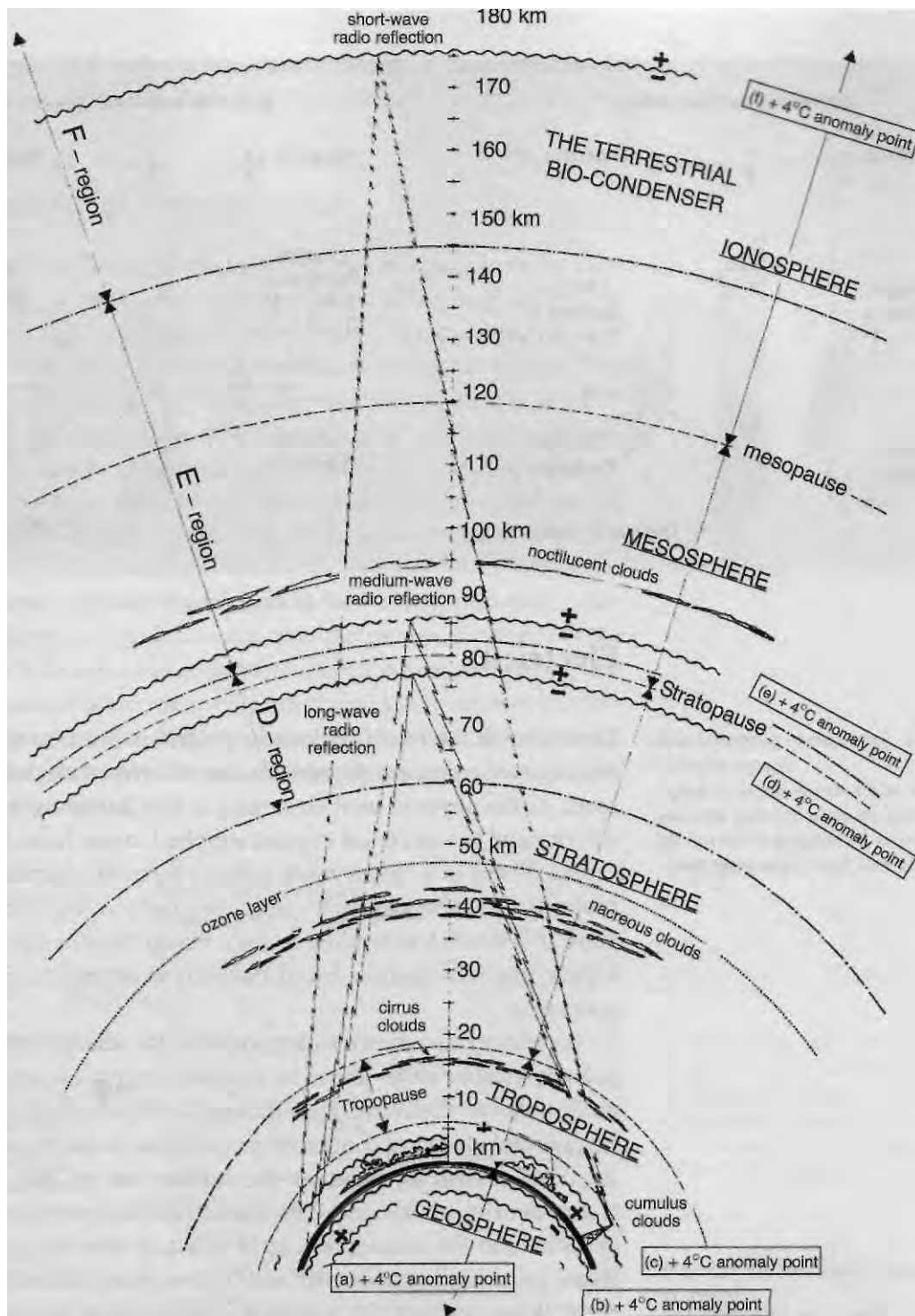
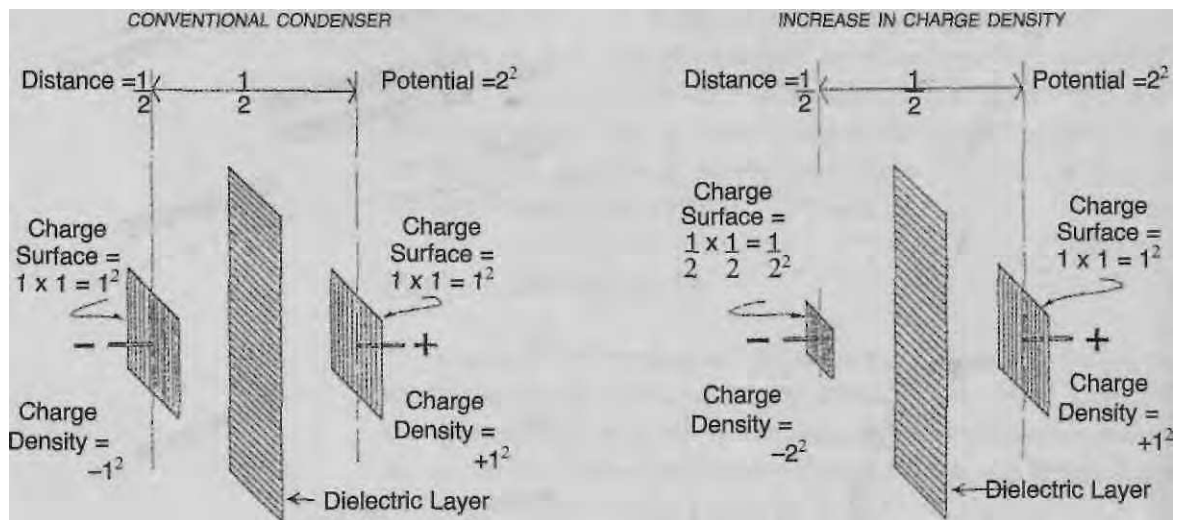


Fig. 7.1. Section through Earth's atmosphere, showing temperature fluctuations.

Galium Coats postulates a series of concentric rings where the temperature reaches water's anomaly point of $+4^{\circ}\text{C}$, which Schauberger identified as water's state of greatest potential, together creating an accumulator of energy to facilitate the emergence of life.



Electricity

Figs. 7.2 & 3. Increase in potential and charge density.

In a condenser for accumulating electrical charge, the energy potential increases by either reducing the area of one plate, or by bringing it closer to the dielectric layer (separating plate).

Electricity is the result of magnet polarities put into motion. In electricity the process depends on the polarity of electrons in the atom. At the physical level electricity is familiar in thunderstorm activity and the electrical current supplied to our homes through cables. There is a much more refined form of electricity more properly called bioelectricity which is produced by living organisms. It is much less studied or even recognized, being an octave higher, but Schauberger found that this is crucial to all natural processes.

For electrical activity to be possible, the charges of different polarity must be either joined by a conducting path or separated by an insulator or dielectric. Figs. 7.2 and 7.3 illustrate two situations in a normal electrical condenser or capacitor for accumulating an electrical charge. By reducing the surface area of one plate, the charge density on that side of the dielectric is increased, in the ratio of its area to the larger plate. So if it is a quarter the area of the larger plate, its charge density will be four times that of the larger plate. What is called the potential is the amount of energy with which the two opposite charges try to balance out the difference. The energy potential increases as the distance between the plates

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is decreased.³ If the area of one plate is reduced at the same time as it is moved closer to the dielectric, the potential is increased exponentially.

The terrestrial biocondenser

While Fig. 7.2 illustrates the principle of a normal electrical condenser, Fig. 7.5 shows the typical situation at layers of the atmosphere where the air temperature is close to the anomaly point of +4°C (39°F). The pure water layer takes the place of the dielectric layer. Generally speaking the positively charged surface is influenced by the positive temperature gradient, and the negatively charged surface by the negative gradient. If the charge of the positive plate is raised, that of the negative plate will rise automatically to the same level, the charges being distributed evenly on the plates' surfaces.

If we now rearrange these plates in the form of concentric cylinders as shown in Fig. 7.4, to simulate the proposed pattern of the +4°C (39°F) condensers in the atmospheric zones, you will see that the surface area of the inner cylindrical plates reduces from the outside inwards and the charge and potential increase automatically. The greater the number of nested plates therefore, the more intense the energy potential.

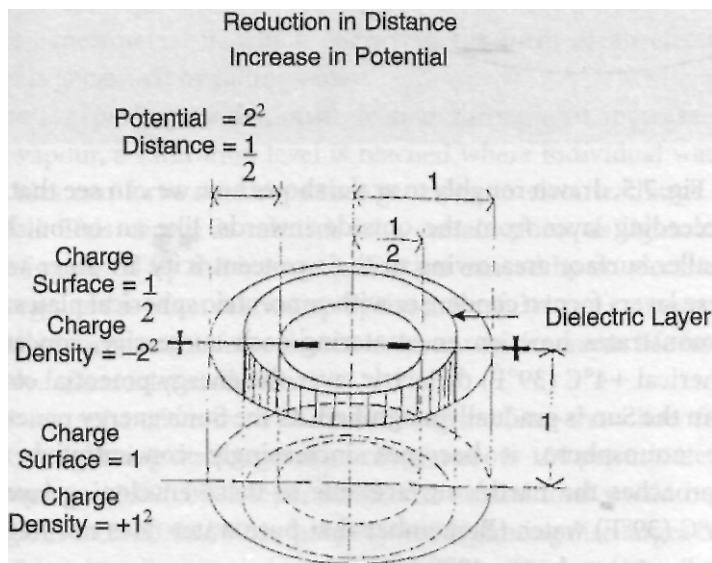


Fig. 7.4. Reduction in distance, increase in potential.
The dielectric layers act like non-conductive membranes or insulators, separating positive and negative charges.

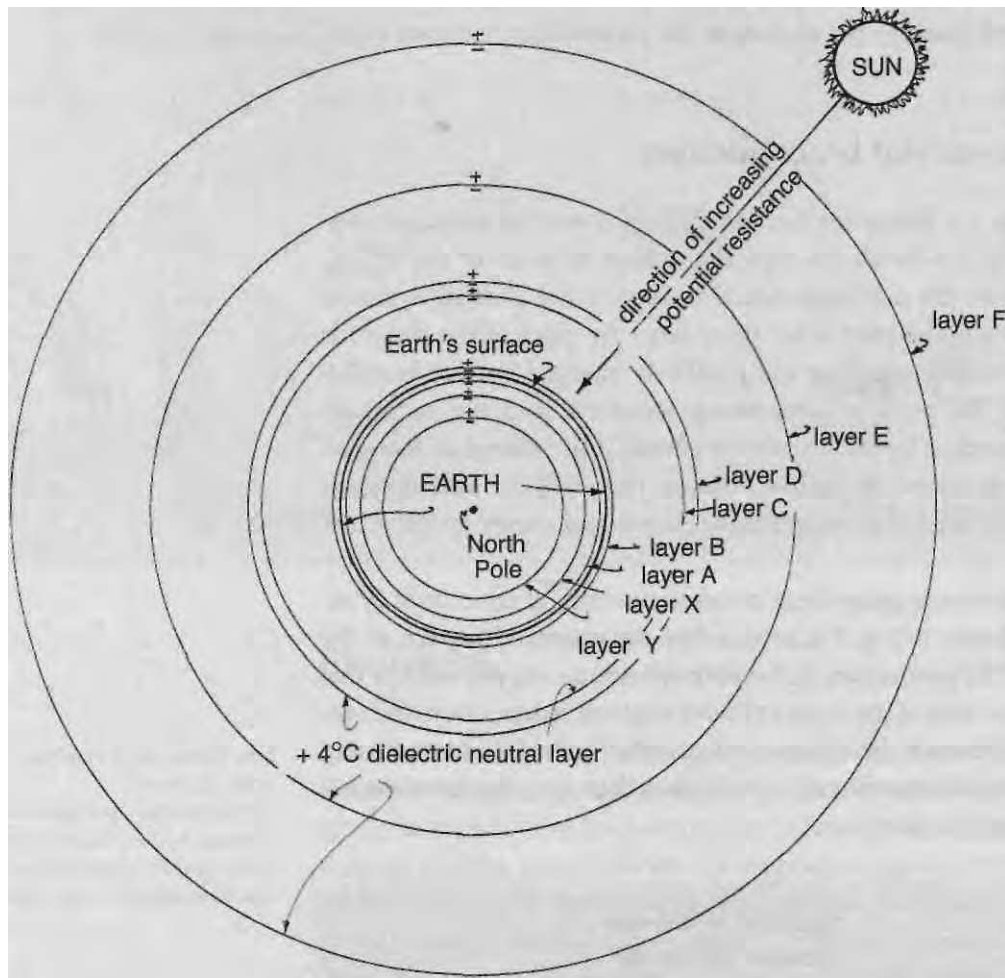


Fig. 7.5. Terrestrial bio-condenser.
A schematic proposed by Galium Coats, illustrating how the Sun's electromagnetic energy is amplified by the diminishing radius of each dielectric layer formed by water strata at a temperature of +4°C.

Fig. 7.5, drawn roughly to scale, shows how we can see that each succeeding layer from the outside inwards, like an onion, has a smaller surface area owing to their concentricity. In other words, these layers form a condenser with concentric spherical plates. This demonstrates how, on encountering each successive, concentric, spherical +4°C (39°F) dielectric layer, the energy potential coming from the Sun is gradually magnified. As the Sun's energy penetrates the atmosphere, it becomes increasingly concentrated as it approaches the Earth's surface, due to these enveloping layers of +4°C (39°F) water. (Remember that pure water does not freeze at temperatures above -40°C / -40°F.)

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Earth as an accumulator of energy

Viewed from a more cosmic perspective these strata are extremely close together, producing a very high potential of energy. Callum Coats proposes an ingenious concept of the Earth as an accumulator of energy gradually building up an electromagnetic charge (Fig. 7.5). This accumulation of energy would naturally enhance the emergence of life because, without differences in electrical charge, gender, potential or a suitable energy field, life is impossible.

Viktor Schauberger was concerned to identify which natural processes and functions might promote the concentration of the energetic matrix within which physical life can evolve. He favoured an energy matrix being created by the 'original' motion of the Earth as it rotates about its own axis and circulates its biomagnetic and bioelectrical energies through itself during its 365.26 day, orbital waltz around the Sun.

It seems reasonable to propose that these variously charged layers in the atmosphere are a product of the Earth's rotation. The +4°C (39°F) layers form charge-resisting strata which may contribute to the reflection of radio waves, though the conventional explanation for their reflection is the different ionization levels, water vapour being present at different densities in the different layers.⁴ The development of electricity can be demonstrated by very simple experiments, in which energy in the form of an electric charge is generated by falling water.⁵

These experiments demonstrate that through an increase of water vapour, a saturation level is reached where individual water molecules can form raindrops that generate an electric charge as they fall. This charge is released at a certain point as lightning. Ozone is created by the intense ionization caused by an electrical discharge, and is often carried up by the powerful rising currents of a thunderstorm, to reinforce the ozone layer, which screens life from excessive ultraviolet radiation.

Photographs taken from Earth-orbiting satellites show how frequent are lightning discharges, occurring at about 100 per minute. If they average 15,000,000kw per strike, the annual total would be a prodigious 13,000,000,000kw/hrs per year.⁶ Lightning discharges can reach 9 km (6 miles), and sheet lightning up to 100 km (62 miles).

7. THE ATMOSPHERE AND ELECTRICITY

There is some evidence in recent years of a decline in thunderstorm activity.⁷

If this were the case, the implications for the protective ozone layer would be serious. Water particles have to be very fine in order to spin fast enough to produce an electrical discharge (the water atom is an electrical dipole). One of the features of more stormy weather is to produce a larger water drop that cannot spin fast enough to produce a significant electrical charge.

Electricism and magnetism

Viktor Schauberger coined the term 'electricism' for the effect that electricity has on life, which is destructive, dismantling, disintegrative and debilitating. Magnetism is the energy that circulates through and around the Earth on its polar axis. Electricism and magnetism are apparently contradictory (or dialectic partners, see p. 47). Together they form the electromagnetic whole, magnetism being the more cohering and life-affirming (female) of the two. Its higher state, biomagnetism, which is associated with living organisms and whose qualities are uplifting and upbuilding, is an energy responsible for the combining of elements in the creative process of building new life forms on a higher, more refined octave (e.g. the fourth dimension). Bioelectricism, on the other hand, is associated with the deconstructive aspect of organic life.

As we saw in Chapter 3, bioelectricism and biomagnetism are complementary, but operate differently in contrasting functions, representing extremes of bioelectromagnetic quality. As in all formative and life-building processes, both bioelectricism and biomagnetism are part of the action, but normally balance each other. However, in order for creative processes to be successful, biomagnetism must predominate.

The Van Allen belts, encircling the Earth roughly over the area between the tropics of Cancer and Capricorn, form the radial expansive (centrifugal) electric (bioelectric) function of the Earth dynamo. The axial magnetic (biomagnetic) contractive (centripetal) function is performed by the magnetic lines of force passing through the centre of the Earth from the South to the North Pole and sweeping around the Earth globe from North to South. Between these two component forces, a pulsation, which is the hallmark of all living things, is created as electrical and magnetic moments

alternately attain their maxima. According to Viktor Schauberger, these oscillations take place at such a high frequency that we cannot perceive them, and view them as a state of rest.

Storms, water vapour and climate

The amount of water evaporated annually from the oceans has been calculated to total about $333,000\text{km}^3$.⁸ By comparison, the amount from rivers, lakes and land surfaces is more like in $62,000\text{km}^3$, or 18.6% of the world's annual rainfall ($395,000\text{km}^3$). This has in the past been derived mostly from forests. However, the enormous deforestation of the last fifty years, particularly for agriculture and beef production, has led to a much higher evaporation rate from the Sun-exposed land surfaces.

This leads to a higher volume of water vapour in the atmosphere, which in turn increases the greenhouse effect, leading to higher temperatures which produce a further increase in evaporation from the oceans.⁹ There is one feedback mechanism which alleviates the increase in surface temperature; this is the increase in cloud cover as a result of the increased water vapour, increasing the reflection of the Sun's energy back into space (the albedo effect).

While this additional water vapour will increase the general atmospheric temperatures, much of it will drift towards the poles due to the movement of the upper air streams, there to fall as snow, adding to the volume of water fixed almost permanently as ice. This abnormal water vapour content increases the amount of cloud cover, increasing the albedo effect by which the Sun's energy is reflected back into space from the clouds' surface.¹⁰

The catastrophic rainfall in some areas like Bangladesh and Mozambique and the severe drought conditions of central Africa and northern China are the result of this serious disturbance of the Earth's water balance. Man's destruction of the forest starts a chain reaction that precipitates the cumulative effects of an increasingly disrupted world climate.

PART THREE



Water — the Source of Life

8. The Nature of Water

The Upholder of the Cycles, which supports the whole of Life, is WATER. In every drop of water dwells a Deity, whom we all serve; there also dwells Life, the Soul of the 'First' substance — Water — whose boundaries and banks are the capillaries that guide it and in which it circulates.

Viktor Schauberger¹

Our Earth is the planet of water. Seventy percent of the world's surface is covered by water. Our bodies are seventy-five percent water. It is essential to all life. Yet, our present science understands little of its real nature. We have no respect for water; we use it for transporting inappropriate substances, usually waste and pollutants. We destroy its complex structures by driving it through turbines, pipes or straightened riverbanks. We treat it as a commodity. Viktor Schauberger called it a living organism, 'the blood of the Earth,' and insisted that in its various forms, as blood, sap or water, it is the basis of all life.

Viktor Schauberger was known as 'The Water Wizard' because he made profound discoveries about its nature. His principal pre-occupation was with water as the key to all life, and its vital relationship to the forest. He saw water as the foundation of all life-processes and the channel that nourishes and energizes all life. He also recognized it as a living entity, whose main function is to accumulate and transform the energies originating from the Earth and the Sun. The source of all our problems, according to Schauberger, is our failure to regard water as an organism; we arrest its creative processes and when it becomes our enemy it can do enormous damage.

As a young man, searching for inspiration in his beloved forest, Viktor was sitting quietly by the bank of a pristine stream when he unexpectedly found that his consciousness entered the water. It connected with an intelligence in the water that spoke to him. It told him what movements it needed to make in order to stay healthy, and under what conditions. It was from this mystical experience that he built up his awareness of how healthy water is

essential for the creation and maintenance of all life. Water needs to flow in a particular dynamic way, and must not become overheated. Movement and temperature are the key criteria for water, and therefore for all life.

Still water is passive; it is amorphous and apparently lifeless. As soon as it begins to move, it is filled with surfaces that define little structures, convoluted in form, and with magical vortical shapes. The nature of water is to move. When it is active it comes alive; in movement it fulfils its potential, which is to bring life.

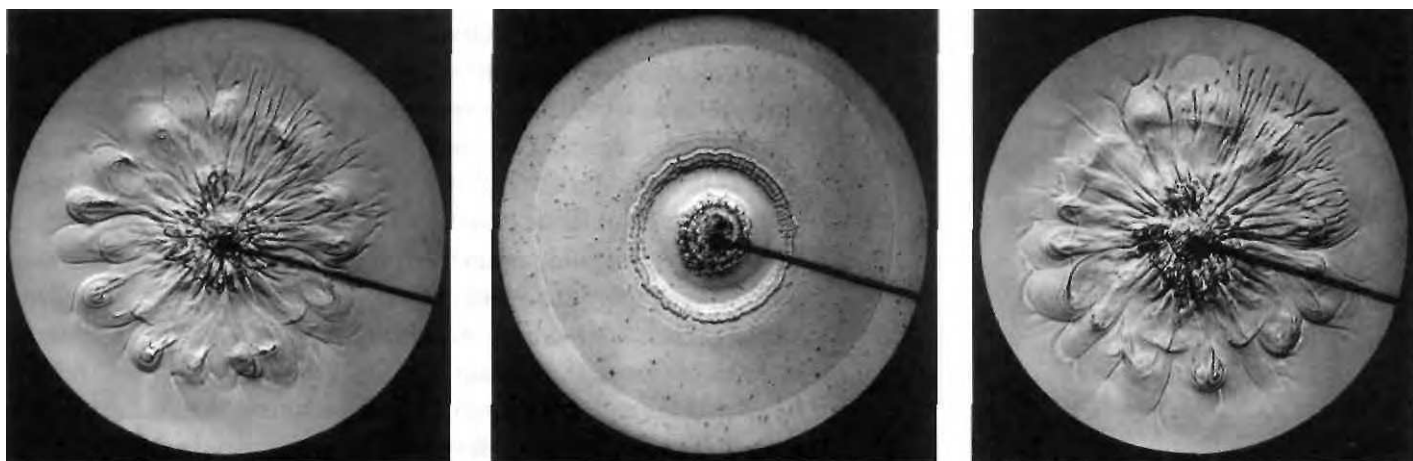
When it is immature, water takes, absorbing minerals with a voracious appetite, to give back the much needed nourishment to its environment only when mature as a mountain spring. Water has a memory; when we think we have 'purified' water of the chemicals and hormones we have mindlessly thrown in, in order to make it drinkable, the energy of these contaminants remain, polluting our energy bodies in the same way that chemicals affect our physical bodies. Because of its nature, water sacrifices itself entirely to the environment, for good or for bad.

People mocked Viktor when he insisted that water behaves like a living organism. When it has reached maturity water displays amazing properties. He showed how, when it is vibrant and healthy, it pulsates, twists and spirals in a very specific way that maintains its vitality and purity, enabling it to fulfil its function for all organisms as an energy channel and a conveyor of nutrients and waste.

If we watch water streaming down an inclining road after a shower of rain, or a rivulet on the sloping beach sand towards the sea, we will notice how it pushes down in a jerky rhythm, as pulsations. That is because water is alive — it actually does pulsate, just as blood pulsates through the veins and arteries of the body. But the most miraculous fact about water is that it has the power of self-purification, and can restore its generative properties in the same way that other living things can heal themselves.

In all symbolic traditions, water is linked with the emotions. It is the emotions that open us out to life, that make us sensitive, receptive and compassionate. Artists love water for its inspiration; it has the ability to stimulate awareness and imagination. I am fortunate to live by a stream; the murmur of a little waterfall by my gate has the quality of calming my emotions. The sounds of water are very evocative; the 'plop' of a drop on a pool surface echoes in the cave;

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the rhythmic crescendo and fall of the waves hitting the rocks, or the swish and suck of the waves on the beach.

Current wisdom accepts that water is important because it is the most common substance on the Earth's surface, and that it is the main physical constituent of all living organisms. But conventional science regards water only as inorganic, with no life of its own.

The memory of water

Water's reputation as a powerful solvent derives from its electromagnetic qualities. The positive hydrogen atoms in the water molecule attract to themselves negative ions from the substance they are in contact with, while the oxygen atom with a double negative charge joins up with positive ions, so that balance is maintained. In this way water breaks down and dissolves substances into their constituent parts, taking oxygen, nitrogen and carbon dioxide from the air, and calcium, potassium, sodium and manganese, etc, from the rocks. Water continually collects substances from one source, depositing them, usually as building blocks for new growth, somewhere else.

When water is flowing as its nature dictates, energetically in spirals and vortices, it creates the structure necessary for it to carry constructive information. These are microclusters of vibrating energy centres, constantly receiving and transmuting energy from every contact the water body makes. Despite water's fluidity and its ability constantly to change its state, the molecules, if conditions permit, generally organize themselves into structures. The vortical

Fig. 8.1. These 'drop' pictures show the structure of water. The first is of living spring water with its structure complete; the second downstream after domestic sewage and industrial effluents, with a trace of rudimentary development, but no formative capacity; a third taken from further down the stream will show how it has, through its natural spiralling movement, rebuilt the water's structure.

New techniques are now being developed for demonstrating photographically the structure of water, e.g. through magnetic resonance equipment, of which the best known are the experiments of Dr Masaru Emoto with ice crystals.

movement creates the microclusters and also a complex laminar structure that generates energy from the interaction of their plane surfaces against each. These structures can be observed with a suitable microscope. The more powerful the vortical action, the greater the storage capacity of information (like adding memory to your computer). Thus water put through Viktor Schauburger's implosion (powerfully vortitized) process (see Chapter 18) has the ability to enhance the energy of organisms with which it comes in contact. The clusters have the ability to store vibrational impressions or imprints. If these are beneficial, they may be able to restore healthy resonance in the human body, as through homeopathy. On the other hand if they are the imprints of toxins or pollutants in the drinking water, they may be carriers of disharmony and disease (see p. 119).

Viktor demonstrated that water as an organism has a life cycle from birth, through maturation to death. When it is treated with disrespect or ignorant handling, instead of bringing life and vitality, it becomes anti-life, facilitating pathogenic processes in the organisms it inhabits, which initiate physical decay and eventually bring death. One of Schauburger's more controversial discoveries was that water that has been structurally damaged takes on negative energy that precipitates deterioration in the human being, affecting our actual moral, mental and spiritual wellbeing.

The creation of water

Where does water come from? No one really knows. It is one of Nature's mysteries. Its source cannot be the upper atmosphere for, as we saw in Chapter 7, the water molecule is actually broken down at high altitudes. The only other source must be the Earth herself. Fascinating research done by the American Stephan Riess in 1934 showed that enormous quantities of virgin water could be obtained from crystalline rocks. A combination of geothermal heat and a process known as triboluminescence, a glow which electrons in the rocks discharge as a result of friction or violent pressure, can actually release the oxygen and hydrogen gases in certain ore-bearing rocks. This process, called cold oxidation, can form virgin water.²

Riess was able to tap straight into formations of hard desert rock of the right composition and produce as much as 3,000 gallons per

minute. Unfortunately, his efforts to provide needy areas with copious quantities of high quality, fresh water were thwarted by Californian politicians with vested interests, and he was persecuted relentlessly. His experiments should now be replicated.

Water is conventionally described as H_2O , having two hydrogen atoms, each carrying a positive external charge, and one oxygen atom carrying two negative external charges. It has, however, been analysed to contain 18 different compounds and 15 separate types of ions.³ Both seawater and our bodies contain 84 elements in the same proportion. There is 4% salt in our blood; in the oceans it is also 4%.

Water is not a straightforward substance with its own identity, for it takes on the qualities of the medium in which it moves, or the organism in which it resides. It has the unusual ability of being able to combine with more elements and compounds than any other molecule and is sometimes described as the universal solvent. Viktor called it an 'emulsion' when it is supercharged with these creative, 'fructigenic' energies. The more diverse the make-up of constituents dissolved or suspended in water, the more complex the emulsion and the broader the range of its properties. (Carbon, its so-called inorganic counterpart, has a similar capacity that no other elements possess.) Water is found in three physical states: solid as ice, liquid as water and gaseous as water vapour. It also comes in many guises and forms: it is saline and fresh, it is blood and it is sap.

The anomaly point of water

The density of water is crucial to its behaviour. It is at its densest and has its greatest energy content at a temperature of $+4^{\circ}C$ ($39^{\circ}F$). This is the so-called 'anomaly point,' which has a major influence on its quality. Viktor called the temperature of $+4^{\circ}C$ ($39^{\circ}F$) the state of indifference of water, meaning that when in its highest natural condition of health, vitality and life-giving potential, water is at an internal state of energetic equilibrium and in a thermally and spatially neutral condition. Above a temperature of $+4^{\circ}C$ ($39^{\circ}F$), water expands. Below this temperature it also begins to expand and become lighter in weight. Because of this ice floats and is able to protect the fish in the water below from extremes of cold.

8. THE NATURE OF WATER

It was very convenient for Nature to arrange that mammals and other creatures should depend on blood. In the body, the temperature of the blood (composed 90% of water) is almost exactly the same as the temperature of water at its point of lowest specific heat of +37°C (+98.4°F). This means that our bodies are able to tolerate a wide range of ambient temperatures, for a great amount of heat or cold is required to change the temperature of water. But it also holds on to heat well; good for body temperature and for domestic heating systems.

We are familiar with the principle that the normal temperature of blood in the human body is +37°C (+98.4°F). A very small change in that temperature indicates sickness. It is the same with water and with sap. Schauberger demonstrated this to the world-renowned hydraulicist, Professor Philipp Forchheimer by putting some hot water into a mountain stream. The marginal rise in temperature downstream caused the complex structure of the water filaments to break down, so that a trout that they had observed holding its station in the torrent was unable to stay, and was swept downstream. Forchheimer was dumbfounded, because conventional science does not recognize the importance of small temperature differences.

If science were able to see water as possessing as well as giving life, it would be a giant step towards the rehabilitation of water in human society. Schauberger wrote:

Were water actually what hydrologists deem it to be — a chemically inert substance — then a long time ago there would already have been no water and no life in this Earth. I regard water as the blood of the Earth. Its internal process, while not identical to that of our blood, is nonetheless very similar. It is this process that gives water its movement.⁴

The symbol H₂O represents pure or distilled water. Schauberger called it 'juvenile' water, because it has no developed character or qualities. It is raw and hungry. Like a baby, it grasps at everything within reach. If you drink only this juvenile water, it will weaken and eventually kill you because it leaches out the minerals and trace elements from your body. Water is mature when it is suitably enriched with raw material, what we call 'impurities,' on which other organisms depend for their energy and life.

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The qualities of different waters

Although good water is tasteless, without colour or smell, it quenches our thirst like nothing else. In order to be healthy, we need to drink, according to some authorities, 1-2 litres (5-9 pints) of good quality water a day.⁵ Some types of water are more suitable for drinking than others. In Chapter 12 we shall consider some of the choices we have of improving the quality of the available water before we drink it. High quality water should contain elements of both geospheric (female) and atmospheric (male).

Distilled Water

Considered physically and chemically to be the purest form of water. Its nature is to extract or attract to itself all the substances it needs to become mature itself, and therefore absorbs everything within reach. Such water is really quite dangerous if drunk continuously long-term. The 'Kneipp cure' uses distilled water for its short-term therapeutic effect, where it acts to purge the body of excessive deposits of particular substances.

Rainwater

If it has not been affected by industrial pollution (acid rain), rainwater is the purest naturally available water. Slightly richer through the absorption of atmospheric gases, it is still unsuitable for drinking in the long term. When drunk as melted snow-water, it also gives rise to certain deficiencies and if no other water is available it can on occasion result in goitre, the enlargement of the thyroid gland.

Juvenile Water

Juvenile water is immature water from deep underground sources, like geysers. It has not mellowed sufficiently on its passage through the ground. It has not developed a mature structure and contains some minerals (geospheric elements), but few gases (atmospheric elements), so as drinking water it is not very high grade (cf most spa waters which arise from mineral rich depths).

Surface Water

Water from dams and reservoirs contain some minerals and salts absorbed through contact with the soil and the atmosphere. Its

quality deteriorates through exposure to the Sun, to excessive warming and to chemicals and other pollutants. Although most urban communities now depend on this source, generally speaking it is not good quality water.

Groundwater

Groundwater has a higher quality due to a larger amount of dissolved carbons and other trace salts. This is water emanating from lower levels, seeping out at the surface after passage along an impervious rock surface. Often this is now polluted by the chemicals of industrial agriculture.

Spring Water

True spring water has a large amount of dissolved carbons and minerals. Its high quality is often shown by its shimmering, vibrant bluish colour. The product of infiltrating rainwater (full complement of atmospheric gases) and geospheric water (full complement of minerals, salts and trace elements), this is the best water for drinking, and it often retains this quality in the upper reaches of a mountain stream. Commercially bottled 'springwater' is unfortunately not always of the best quality — many are not from true springs — even if it is bottled in glass rather than the plastic which impairs its quality.

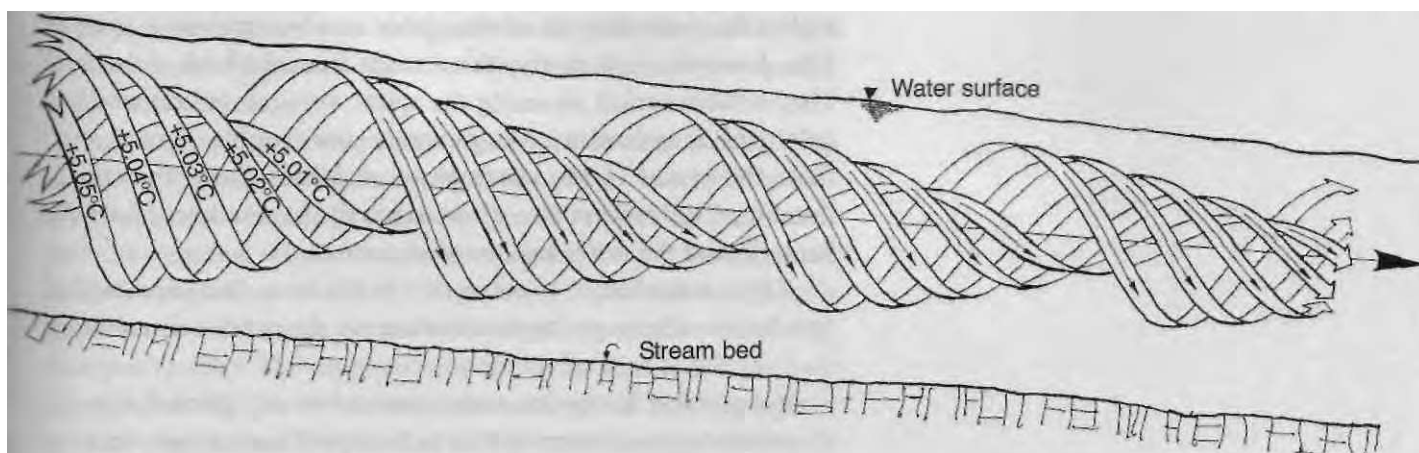
Other Groundwater

Artesian water is obtained from boreholes and is of unpredictable quality. It may be saline, brackish, or fresh. Water from wells can vary from good to poor, depending on how deep is the well and what stratum of water is tapped, and they can be polluted by nitrates and herbicides.

How the river protects itself

Schauberger saw water as being conceived in the cool, dark cradle of the virgin forest. As it slowly rises from the depths, water matures. It absorbs minerals and trace elements on its upward path. Only when it is ripe will it emerge as a spring. A true spring, (compared to a seepage spring), has a water temperature of about +4°C (39°F). In the cool, scattered light of the forest water begins its long journey down the valley as a lively, sparkling and gurgling stream.

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Water, when it is alive, creates this spiralling, convoluting motion to retain its coolness and maintain its vital inner energies and health. It is thus able to convey the necessary minerals, trace elements and other subtle energies to the surrounding environment. Have you noticed how refreshing and enlivening it is to sit by a healthy bubbling stream?

Naturally flowing water seeks to protect itself from the damaging direct light of the Sun. The reason that you find trees and shrubs growing on the banks of streams is not from people planting them, but because the energies from the flowing stream facilitated their growth there, to shade the water. When a stream is able to maintain its energies, it will rarely overflow its banks. In its natural motion, the faster it flows, the greater its carrying capacity and scouring ability and the more it deepens its bed (Fig. 8.2).

Schauberger discovered the reason for this — that in-winding, longitudinal spiral vortices form down the central axis of the current, moving alternately clockwise and anti-clockwise. The nature of inwardly-spiralling vortical movement is to cool. So these complex water movements constantly cool and re-cool the water, maintaining it at a healthy temperature, leading to a faster, more laminar, spiral flow, ejecting or transforming undesirable substances.

As the stream gets bigger, it is less able to protect itself from light and heat, and it begins to lose its vitality and health, and with this its ability to energize the environment through which it passes.

Fig. 8.2. A longitudinal vortex showing laminar flow about the central axis. The coldest water filaments are always closest to the central axis of flow. Thermal stratification occurs even with minimal differences in water temperature. The central core water displays the least turbulence and accelerates ahead, drawing the rest of the water-body in its wake.

Ultimately becoming a broad river, the increasing silt content makes the water flow more sluggishly and become more opaque. This, however, protects the lower strata from the heat of the Sun. They remain cooler, retaining the spiral, vortical motion which is able to shift sediment of larger grain-size (pebbles, gravel, etc.) from the centre of the watercourse, and keep down the risk of flooding. This motion also discourages the generation of harmful bacteria and the water remains disease-free.

Viktor Schaubberger wrote in 1933 in his book, *Our Senseless Toil*, how he was able to put to practical use his discoveries about water:

It is possible to regulate watercourses over any given distance without embankment works; to transport timber and other materials, even when heavier than water, for example ore, stones, etc., down the centre of such watercourses; to raise the height of the water table in the surrounding countryside and to endow the water with all those elements necessary for the prevailing vegetation.⁶

The temperature gradient

One of Viktor Schaubberger's most important discoveries was to do with temperature. He showed how small variations of temperature are as crucial to the healthy movement of water and sap as they are for the human blood. He clarified this by identifying temperature change in its relationship to the anomaly point of water +4°C (39.2°F). When the temperature departs from this anomaly point, either up or down, it is said to have a negative gradient. When it approaches the anomaly point, from either direction, or when the groundwater is colder than the air temperature, it has a positive gradient. Heat always moves towards cold.

In the natural process of synthesis and decomposition in all waters, trees and other living organisms, both the rising and falling temperature gradients are active. Each form of gradient has its special function in Nature's great production; the positive (cooling) temperature gradient must play the principal role if evolution is to unfold creatively.

This important factor affects all the features of a river, such as flow velocity, tractive force (shear force), sediment load, turbidity, and viscosity, and everything to do with water management generally, like its

storage and transport through pipes (see Chapter 12). It is because modern hydrologists do not recognize the temperature gradient that they are unable to prevent rivers flooding or to deliver better quality water to our homes.

In Nature, the positive gradient is used for creating and building life forms, the negative for breaking down as part of recycling. Biodiversity and evolution, in order continually to develop more complex life systems, require the finer energies that a predominating positive temperature gradient will provide. These two temperature gradients co-exist in the same environment because they have complementary roles. The problem with our civilization is that we have allowed the negative to become dominant, so we have disappearance of species, and the prevalence of coarser energies that result from a degenerating environment.

The quality of any process in Nature depends on the relative influence of the positive and negative temperature gradients. The way the two forms of temperature interact is of crucial importance, for this affects not only the movement of water, but sap in plants and the flow of blood in our veins. It also determines the configuration, structure and quality of the channels, ducts and vessels surrounding and guiding them, as we shall see later.

Schauberger called the stronger temperature behaviours 'essences,' for they have a critical effect in creating life forms. For example, if the positive temperature gradient is very powerful, then the reciprocally weaker negative temperature gradient will help the manifesting of a high quality substance in material form. On the other hand, if the negative temperature gradient is dominant, what manifests is a material substance of poor quality. For evolution and growth to proceed with increasing quality, vitality and health, which form is uppermost and at what level is significant.

Flowing water behaves according to whichever temperature gradient is active. The positive temperature gradient builds up living systems by cooling, concentrating, and energizing as it approaches +4°C (39°F). The key to this process of healthy growth and development is that the ionized substances are drawn together into intimate and productive contact, and the contained oxygen becomes passive and is easily bound by the cool carbonates,⁷ the building blocks of life. The increasing warming of the negative temperature gradient however, reduces the cohering energy and loosens the structure of an organism and the forms start disintegrating. The

oxygen becomes increasingly aggressive and instead of helping to build structures, pulls them apart, encouraging pathogenic disease.

If only our science would recognize the importance of temperature in natural processes and we could rapidly implement changes throughout our technologies, the effect on our environment would be immediate. Our current environmental crises are not limited to increasing global warming through entropic heat pollution. If our technologies were more eco-friendly, there would quickly be a magnifying effect of balancing in the environment, a positive feedback effect, because Nature is always seeking balance. We seem to think that working with Nature is like trying to be honest in our lives (a nice thing to do). In fact Nature's need for balance is so powerful that once we began seriously to work with true ecological integrity, we would be amazed how our efforts would be reciprocated and amplified by Nature.

Schauberger demonstrated, not only that living water possesses extraordinary healing properties, but that it is possible, by designing machines which follow Nature's dynamic processes, to produce this living water from lifeless water.

In this way it is possible to produce quality drinking water for humans, beasts and for plants artificially, but in the way that it occurs in Nature; to render timber and other such materials non-flammable and rot resistant; to raise water in a vertical pipe without pumping devices; to produce any amount of electricity and radiant energy almost without cost; to raise soil quality and to heal cancer, tuberculosis and nervous disorders.

... The practical implementation of this... would without doubt require a complete reorientation of all areas of science and technology. By applying these new found laws, I have already built some large structures for log-rafting and river regulation, which have functioned faultlessly for a decade, and which today still baffle the water hydraulics experts.⁸

9. The Hydrological Cycle

In the same way that blood flows through the arteries and veins of the human body, so does water through the lithosphere of the Earth. The cyclical movement of water from subterranean regions to the atmosphere and back again is called 'the hydrological or water cycle.' Today this complete circulation of water is usually interrupted by human intervention, being limited to the atmosphere and the Earth's surface. Viktor called this the half hydrological cycle, the shortcomings of which contribute significantly to our present climate change.

The full hydrological cycle

The diagram below (Fig. 9.1) shows the full hydrological cycle. At the left hand side the upward, anti-clockwise spirals indicate the evaporation of water from the sea. This rises, condenses and falls as rain. Some sinks into the earth and some drains away over the ground surface, depending on whether the ground is forested and what type of temperature gradient is active. In areas of natural forest where a positive temperature gradient normally prevails about 85% of rainfall is retained, 15% by the vegetation and humus and about 70% sinking to the groundwater aquifer and underground stream recharge.

This underground recharge is important, because water that is linked to the subterranean water system acquires the negative energy charge of the Earth. In a natural forest, the mature trees with deep roots bring up this negatively charged water, along with vital minerals and trace elements from the deeper soils. As we shall see in Chapter 14, trees act as biocondensers, harmonizing the positive energy from the Sun with the negative energy of the Earth. As a result, the evapo-transpiration from the leaves of the trees is a balanced, creative energy. This is shown in the diagram as a different direction of spiral from the evaporation from the oceans, to indicate its superior quality. The forest, as a more dynamic living system, creates transpiration that carries the energy (nonmaterial) imprint of all the resonances of the complex biosystem, including the subterranean

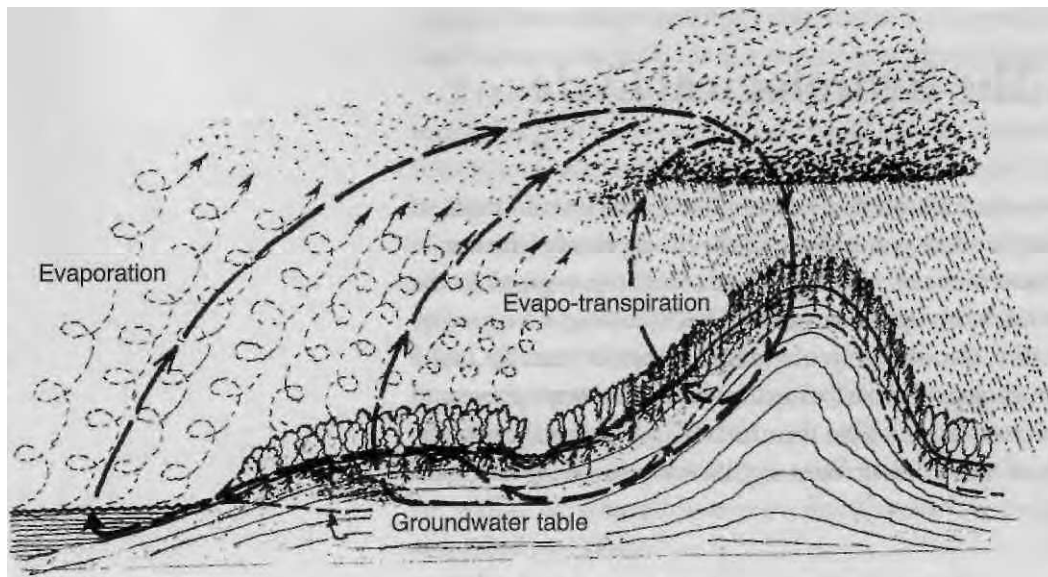


Fig. 9.1. The full hydrological cycle.

The FULL CYCLE of water, is characterized by the following phases:

- Evaporation from oceans and evapo-transpiration from vegetation;
- Rising water vapour;
- Cooling and condensing;
- Formation of clouds;
- Precipitation as rain;
- Infiltrates the ground under positive temperature gradient;
- Recharge of groundwater and aquifers;
- Maintenance and regulation of height of groundwater;
- Formation of +4°C centre-layer of the groundwater;
- Creation of underground retention basins;
- Passage through the +4°C centre-layer of the groundwater;
- Purification at this temperature;
- Further sinking into the subterranean aquifers due to its own weight
- Transition to a vaporous state due to the influence of the Earth's hot interior
- Rising again towards the ground surface with the simultaneous uptake of nutrients;
- Cooling of the water and deposition of nutrients;
- Draining away over the ground surface;
- Evaporating and forming clouds;
- Falling again as rain — and so on.

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elements. Rainfall generated from the forest will carry this beneficial influence. The ocean, although it is recharged by undersea volcanic eruptions and exposure to the atmosphere, mainly consumes all it produces and therefore lacks these dynamic qualities.

This is best explained in terms of homeopathic theory, in which the greater the dilution of a substance, the more powerful its energetic effect. One of the most important discoveries by Professor Jacques Benveniste is that water (even in the form of vapour) carries information.¹ The implication of this is that our tap water may contain the energies that are recycled from human sources, but also that water can be imbued with a healing energy that can be used to treat other water. Some of the domestic water treatment systems now available use this principle.

In the full cycle, water evaporates from the forest and the oceans. The rising water vapour cools with altitude, condenses, forms clouds, with the help of dimethyl sulphide emitted from the leaf protoplasts and from marine algae, combines into larger drops and falls as rain. With full forest cover the temperature of the land surface is cooler than the falling rain, which readily soaks into the ground because of the positive temperature gradient. In other words, the temperature decreases from the atmosphere, through the earth towards the central layer of the water-saturated ground where the temperature is +4°C (39°F). As it falls on the cooler ground, the warmer rain is easily absorbed; it replenishes the groundwater, developing subterranean aquifers. Vegetation depends on groundwater being recharged by rainwater entering under a positive temperature gradient (Fig. 9.1).

The temperature range that life on Earth has adapted to lies roughly between -10°C (14°F) and +40°C (104°F). It is the balanced greenhouse effect that maintains this range. As global temperatures rise with global warming, the stress on all life forms is immense, because they do not have time to adapt to the new conditions.

Water vapour is the principal greenhouse gas. The reduction in evapo-transpiration from the dynamic forests substantially affects the quality of the water vapour and its distribution in the atmosphere. The water vapour created by the natural forest has been balanced by fertile energies from the Earth that bring with it the power to stimulate and heal. Water vapour from the oceans has more of the raw untamed energy of the Sun, and global warming increases the evaporation from the oceans. Without the forest's water, there is a greater contrast between areas with abundant water vapour and

9. THE HYDROLOGICAL CYCLE

those with almost none. This greatly disrupts weather patterns, with an increase in violent storms, hurricanes and serious flooding near coasts, while the areas away from coastal winds suffer droughts and freezing night temperatures.

The half hydrological cycle

Without forest cover, the ground surface overheats, causing a negative temperature gradient in the soil. This means that the cooler rain cannot penetrate into the warmer ground, and fast surface runoff in areas of heavy rainfall causes catastrophic floods. The cause of the floods in recent years, in Columbia, Mozambique, Assam and Bangladesh was the deforestation on high ground.

This disruption of the natural water cycle Schauberger called the half hydrological cycle, which is now prevalent almost worldwide. Notice the difference between Fig. 9.2 below and Fig. 9.1 on p. 118. The drawing below shows that, in the absence of tree cover, the water table has sunk. Once the forest has been removed, the exposed ground heats up rapidly, all the more so if dry, and to much higher temperatures.

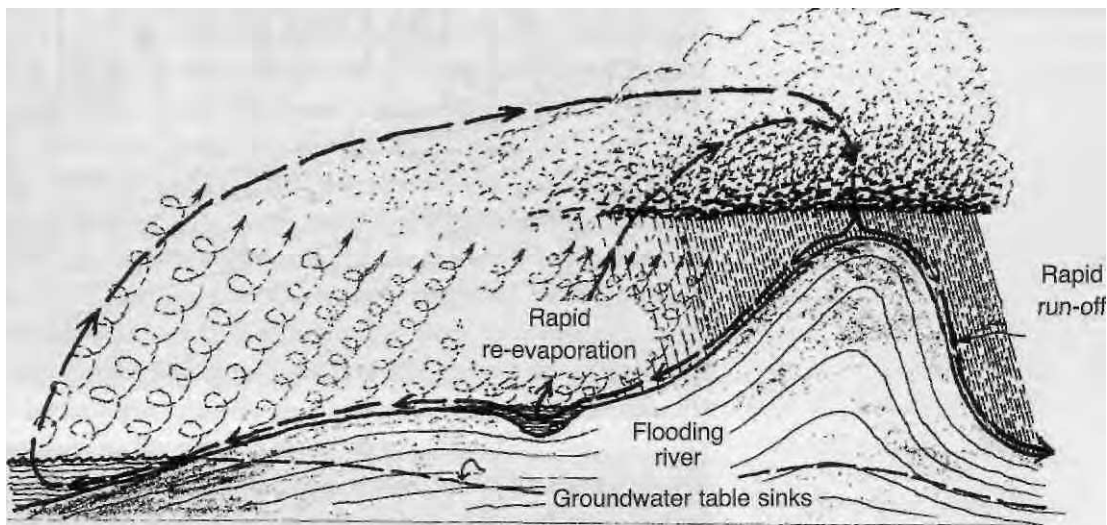
This type of evaporation, now lacking the evapo-transpiration from living things, has more destructive energies. If the rainfall is excessive, then flooding inevitably occurs. In many hot countries denuded of vegetation, dry valleys and creeks can be suddenly engulfed by a wall of water as terrifying flash-floods sweep away everything in their path.

In the absence of trees and ground cover to absorb it, the rainwater spreads widely over the surface of the ground, resulting in massive abnormal re-evaporation. The increase in water vapour in the atmosphere soon causes increased precipitation. What happens is that one flood causes another, while in inland areas, droughts become more frequent. The only answer to this vicious cycle is a massive international campaign to plant trees, particularly in the warmer latitudes.

The most serious result of the half cycle is that there is no replenishment of the groundwater. With the sinking of the groundwater level, the supply of nutrients to the vegetation is cut off. The water that is evaporated into the atmosphere is virtually lifeless, lacking in the energy and the qualities that groundwater acquires. Viktor Schauberger called this a 'biological short-circuit.' The essential soil moisture, trace elements and other nutrients that the tree roots nor-

mally raise to the benefit of other plants sink below reach as the groundwater sinks. This is the cause of desertification, now becoming prevalent in many tropical areas. The groundwater disappears, probably for ever, into the womb of the Earth where it came from.

The limited circulation of the half water cycle increases the intensity of thunderstorms. These can raise the water vapour to levels far higher than normal. At altitudes of 40-80 kilometres it is exposed to much stronger ultraviolet and high-energy gamma radiation, which break up the water-molecule, separating the hydrogen and oxygen



The HALF CYCLE in contrast, has the following features:

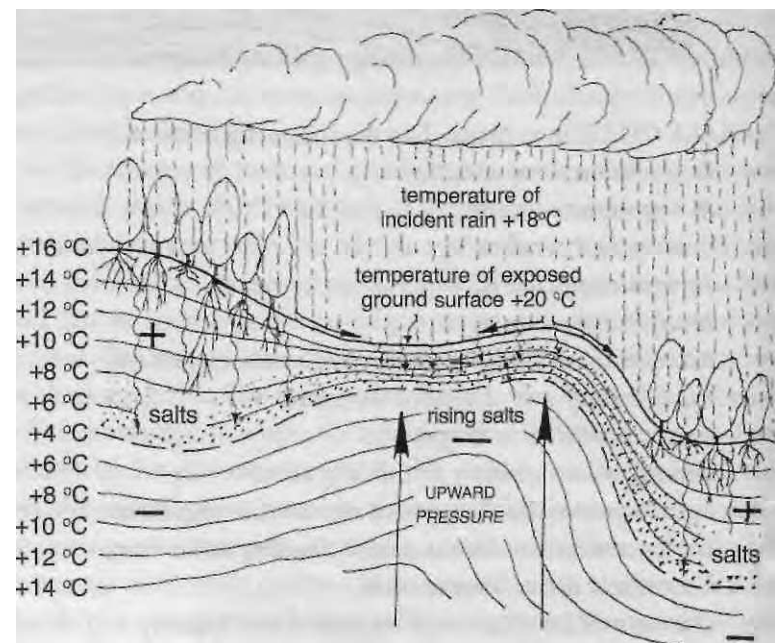
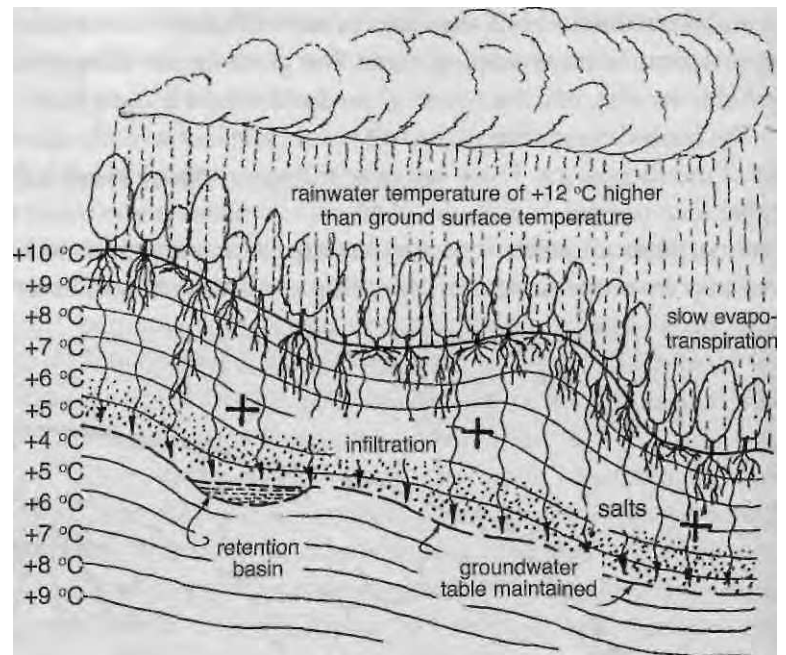
- Evaporation from oceans;
- Rising water vapour;
- Cooling and condensing;
- Formation of clouds;
- Precipitation as rain;
- No infiltration due to negative temperature gradient;
- Rapid runoff over the ground surface;
- No groundwater recharge;
- Sinking water table — in the long term;
- Cessation of natural supply of nutrients to vegetation;
- Under certain conditions, major flooding can occur;
- Excessively fast re-evaporation;
- Oversaturation of atmosphere with water vapour;
- Rapid reprecipitation as storm rain.

Fig. 9.2. The half hydrological cycle.

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Fig. 9.3 a&b. Positive and negative temperature gradients:

Fig. 9.3 a illustrates a positive temperature gradient — ground cooler shaded by trees — rainwater warmer than the ground surface will soak in easily, recharging the groundwater. But where the surface is unprotected (Fig. 9.3 b) it heats up, does not allow the rainwater to penetrate (negative temperature gradient), causing the water table to be forced upwards, with the dissolved salts, which remain near the surface, possibly causing problems of salination.



atoms. The hydrogen then rises because of its lower specific weight, and the oxygen sinks. That water becomes permanently lost. The effect of global warming is complex. The atmosphere first warms up due to the greater amount of water vapour, some of this increase of heat being offset by the loss of water atoms at high altitudes.

Temperature gradients and nutrient supply

As we have seen, unless vegetation keeps the ground surface cooler than the falling rain, the water will not easily penetrate the soil. The direction of the temperature gradient indicates the direction of movement. Energy or nutrient transfer is always from heat to cold. So a positive temperature gradient is also essential for nutrients to be able to rise up to the roots of the plants (see Fig. 9.3).²

If the surface is well forested, the rainwater is warmer than the soil, and penetrates to the lower strata, replenishing the groundwater body and the aquifers. The salts remain at a level where they cannot pollute the upper strata where they would harm those plants which are salt-sensitive. The groundwater hugs the configuration of the ground surface. Fig. 9.3 shows how the salts in the ground rise near the surface, particularly on a hilltop, when part of the forest is cut down, leaving the ground exposed to sunlight.

Schauberger demonstrated that when light and air are absent well below the surface of the ground, the minerals and salts are precipitated near the temperature horizon of +4°C (39°F). Warm ground will encourage evaporation of the moisture near the surface, so that the minerals and salts are deposited near the surface, lowering the fertility of the soil. If all the trees are removed (Fig. 9.4), there will be no penetration of rainwater; the water table initially rises, due to the now uncompensated upward pressure from below described in the following chapter, bringing up all the salts, but will eventually sink or disappear altogether without the replenishment of rainwater. Fertility can be restored in time only through reforestation, bringing about the reestablishment of a positive temperature gradient.

Replanting must be done initially with salt-loving trees and other primitive plants, as only they would survive under such conditions. Later, due to the cooling of the ground by the shading of the pioneer trees, the rainwater can penetrate the ground, taking the salts with it. Over time, as the soil climate improves the pioneer

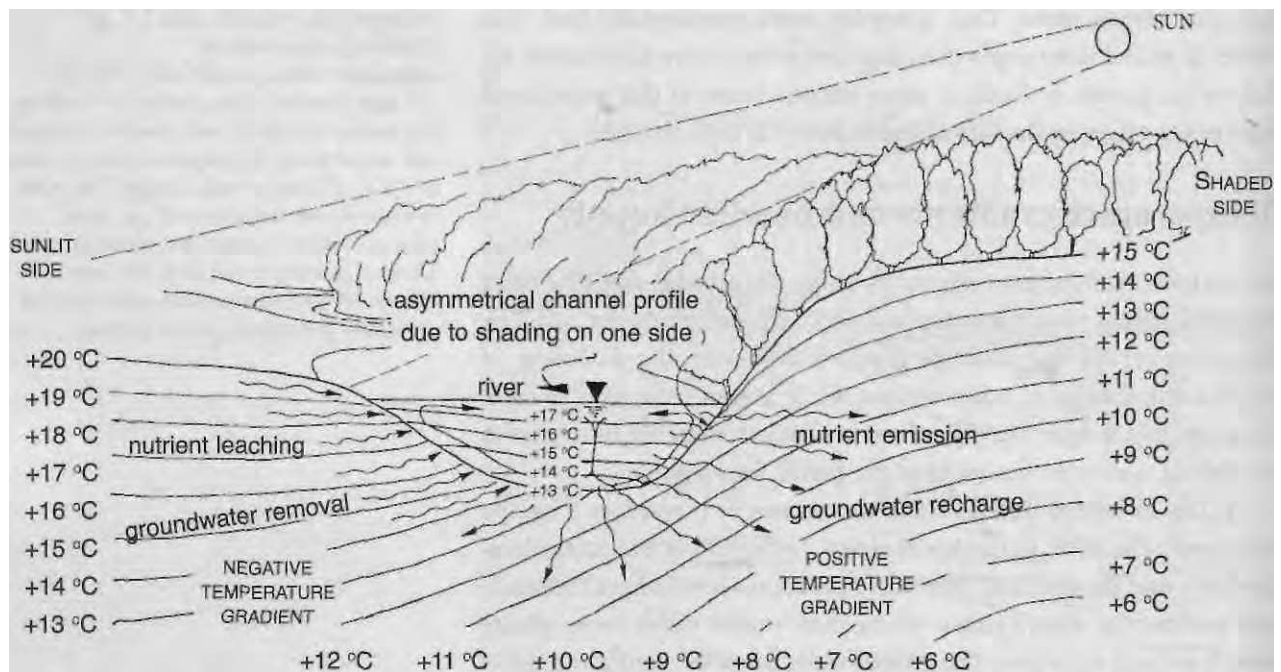


Fig. 9.4. Asymmetric river development. The orientation of a river relative to the Sun's position affects the nutrient supply. Where the river flows east > west or west > east, the side nearest the Sun tends to be more shaded and the water cooler; a positive temperature gradient develops, allowing the cooler ground to absorb mineral-rich waterfront the river, and the soil becomes more fertile. On the side exposed to the Sun, the reverse occurs, with a negative temperature gradient forcing groundwater, with its minerals to leach into the river.

trees die off, because the improved soil conditions don't suit them. Other species of tree can replace them and the dynamic balance of Nature is restored.

Irrigation in hot climates aggravates the problem because, as the ground temperatures cool during the night, the irrigating water can penetrate the upper salt-containing strata. With the increase in temperature during the day, the infiltrated irrigation water with its acquired salts are drawn up, and upon exposure to light and heat are deposited on the soil surface. The seriousness of the problem will vary with latitude, height and season.

All healthy rivers will carry nutrients in suspension that will be absorbed by the vegetation on the river banks if the soil is cooler than the river water. This improves soil fertility and recharges the groundwater. But, if the soil is warmer than the river, due to the absence of protective cover, a negative temperature gradient will cause the nutrients to leach from the soil into the river, which will eventually make the soil sterile and unproductive. The longer a river flows through irrigated, sunlit farmlands, the more it becomes contaminated with salts, artificial

fertilizers and pesticides, making it unhealthy in the lower reaches as a source of water.

In the diagram (Fig. 9.4) opposite, the river water temperature varies from +17°C (63°F) at the surface to +13°C (55°F) at the bottom. Where the ground under the wooded area on one side of the river is cooler than the river water, a positive temperature gradient exists from river to ground. On the opposite side, in the absence of trees, the ground is warmer and attracts a negative gradient from river to ground. The diagram shows nutrients being removed from the warmer bank and deposited on the opposite, cooler bank.

Where the tree cover cools the river, it flows faster with a laminar structure, removing sediment and deepening its bed.

The rivers are the arteries of Gaia. If they are not allowed to operate as natural conveyors of energy and nutrients to the land through which they flow, the fertility of the land gravely suffers. If we were really to take care of our rivers, protecting their banks from overheating, and allowing them to flow sinuously as they will, rather than make them follow straight lines, we would be taking important steps to give back to Nature her own power.

10. The Formation of Springs

Before the installation of public water networks, springs were the most valued or sometimes the only sources of drinking water, and they still are in many parts of the world. Settlements would establish around a spring that delivered high quality water. Possibly because of the connection between living water and good health, some established a reputation for curative powers. Viktor Schauberger insisted that the high quality water produced by his springwater machine had healing qualities.

The veneration of springs

Springs have long been associated with folk medicine, ritual and religion, frequently being reported as places of power in the landscape. Usually, springs thus endowed are called 'holy wells' which is confusing, because the word derives from the Anglo-Saxon for spring — wella, (hence the expression to 'well up') not for its modern use as a shaft excavated to reach the underground water table. The tradition of venerated springs is found in all cultures and major religions, including the earliest known to us. The most common association is the bestowal of supernatural qualities, but more specifically as the abode of spirits or deities, or being linked with holy figures or saints. In Britain, in most cases the saints named had no connection with the site, but their qualities may be associated with those the previous pagans had ascribed.

The waters of most sacred springs are credited with healing powers, and with cures accomplished by bathing or drinking. In British lore the most common affliction claimed to be healed by springs is infertility, followed by eye complaints. However some springs are regarded as so powerful — as at Lourdes in France, or Bath in England — that they are reputed to heal many diseases. Offerings were made to the pools served by the springs, either as part of the locally established ritual, or as a 'trade' for a wish to be granted. Many 'wells' were 'dressed,' or decorated with flowers, paintings, statues or strips of cloth, a tradition found all over Europe and Asia, in Africa and Central America.

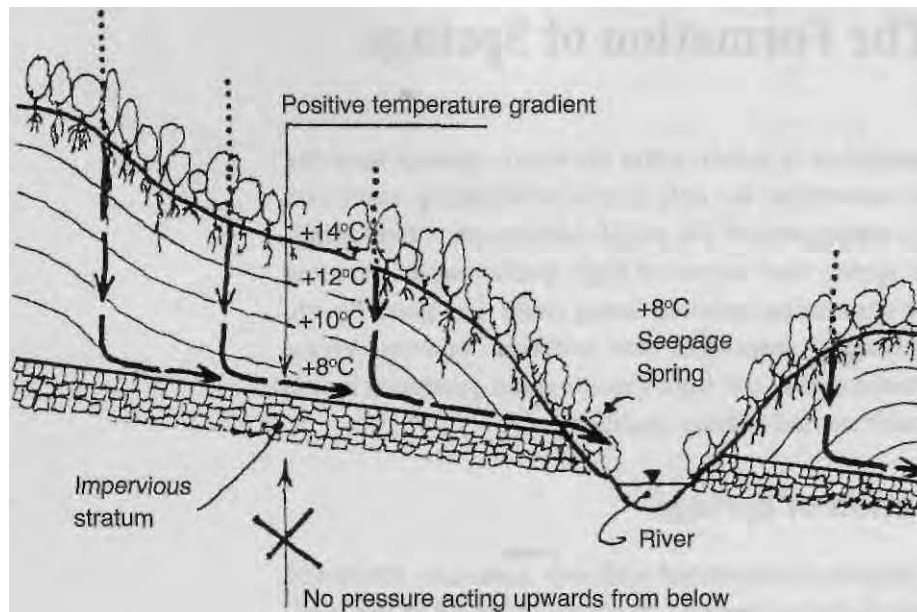


Fig. 10.1. Seepage spring.

Seepage springs occur when water infiltrating the ground (positive temperature gradient) encountering an impervious layer, seeps down this slope emerging where it meets the ground surface. The amount of the infiltrations determines the outflow rate and its temperature that of the surrounding area, seldom very cold.

Natural springs would be valued also because the quality and reliability of the water flow in times of drought might make the difference between life and death. It is not hard to see why people invested these sites with magical powers, or seeing them as inhabited by a living spirit who was the guardian of the waters. It is likely that many of our forebears would empathize with Viktor Schauberger's vision of water as 'the blood of the Earth' when they saw the pure, cold, nourishing liquid issuing mysteriously from the womb of the Earth.

Rivers frequently have their source at a spring.¹ The source of a great holy river is regarded as particularly sacred. Many churches and monastic institutions are associated with springs, the churches using the water for baptism. The monasteries pioneered the capping of the springs to deliver the water through wooden or stone 'conduits.' These proved to be the salvation of growing urban populations in England who, after the dissolution of the monasteries in the sixteenth century, would take 'feathers,' or branch pipes, off these monastic conduits. Like the springs from which they derived, in some localities these conduits were often venerated and adorned with flowers and gilded branches.

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When the rationalism of the Enlightenment replaced the superstitions of an earlier age, some explanation had to be found for the curative powers of certain famous springs. This led, in the 18th century, to the birth of the spa culture, and doctors would examine any deposits left behind when they had boiled away the water, in order to identify this and that mineral as the true elixir that would give legitimacy to their spa water. During the Protestant Reformation in England, and then with the decline of rural populations, many sacred springs fell into disuse, being rediscovered by Irish immigrants in the nineteenth century, whose Celtic-based Catholicism still had strong pagan roots.

Today, with the revival of ancient rural traditions, many sacred springs are being restored in Britain and in Continental Europe.

Seepage springs

What is generally understood as a spring is actually not a true spring, but a seepage spring which is the overflowing of surplus water from soil and rock strata that have a limited depth (Fig. 10.1). Rainwater which is warmer than the ground (a positive temperature gradient), soaks in and descends until it reaches an impervious layer like clay, which channels it out as a stream to the surface again, lower down. It acts by gravity. The temperature of the water will be that of the strata from which it emerges, probably between +6°C (43°F) to +9°C (48°F). This water will contain some trace elements, minerals and dissolved salts but, generally speaking, not in such a broad spectrum as true springs. The seepage spring responds quickly to variations in precipitation, frequently drying up in a hot summer, and flowing strongly after heavy rain.

True springs

A true spring originates from much deeper strata (Fig. 10.2). Water collects in ancient aquifers and retaining basins over many years, and the water emerging to the surface might be hundreds of years old; or even thousands in the case of the famous therapeutic hot springs. Because of their age, these spa waters are extraordinarily rich in well-balanced minerals. The rich waters of the Hunza Valley in Pakistan, or the Caucasus mountains, which are credited for the longevity of the local people, also originate in true

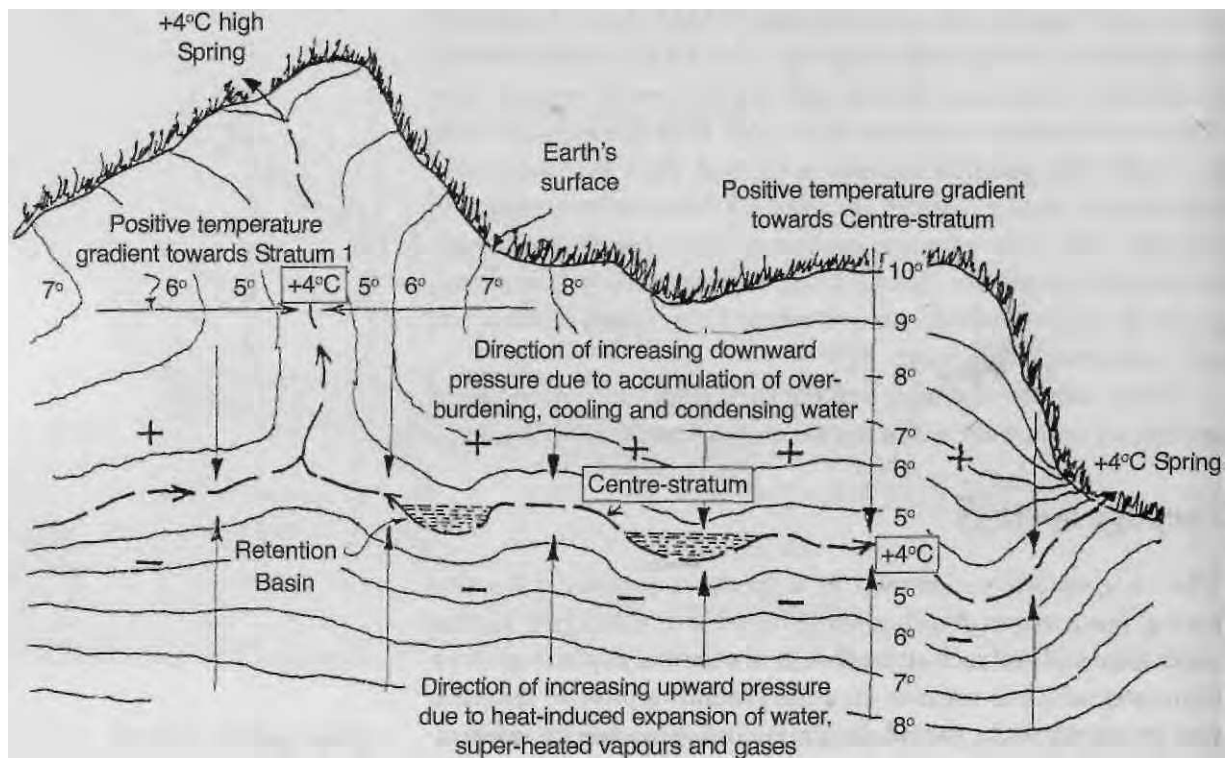


Fig. 10.2. True springs and high altitude springs. These depend on the existence of the 39°F (+4°C) denser water level which is called the centre stratum. This gets squeezed between the weight of water in the rocks above, and the water strata below. At 39°F (+4°C) it will compress no more, and has to move vertically or laterally, eventually emerging as a spring. This is why they are normally very cold and may appear on mountain tops.

springs. The difference here is that, emerging in the high mountains, these waters are then augmented by rich glacial waters, and by minerals from the action of the aggressive mountain streams eroding the surface rocks.

The rainwater penetrates the ground surface under the influence of a positive temperature gradient, in a way similar to that of a seepage spring. But it is drawn down much more deeply, helped by the increasing pressure, so that it condenses and cools to around +4°C (39°F). Being immature water, it will absorb what it can, so it removes salts from the upper layers of the ground, depositing them later as the water condenses and cools with depth. This makes the upper layers more fertile, and the salts are now available to deep-rooted trees that have the ability to metabolize them, converting them to nutrients for more shallow-rooted plants.

The downwards-percolating rainwater increases the pressure on the groundwater body, pressing the lowest layer into rocks that

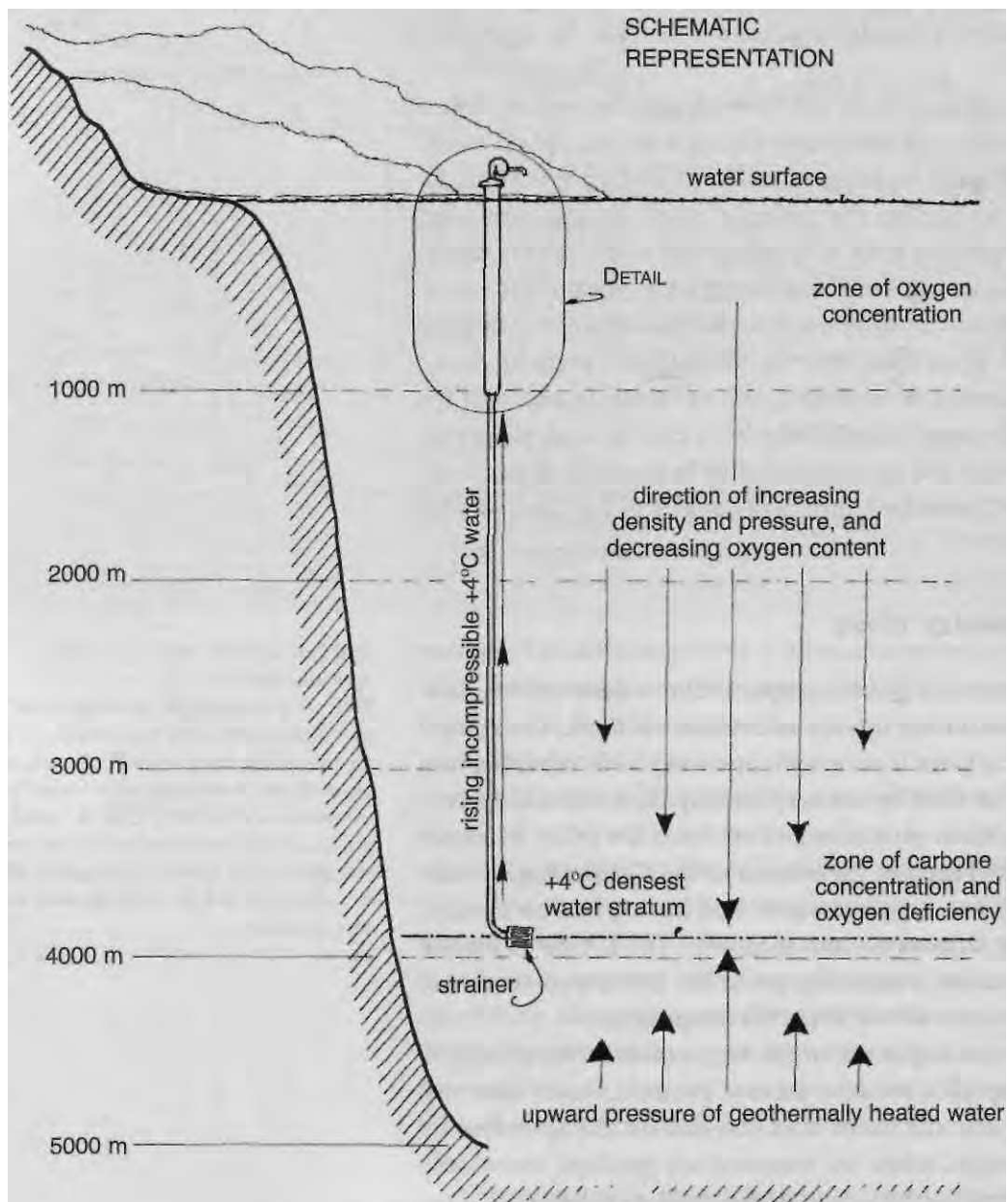
are affected by geothermal heat. These are caused to expand, compressing the layers above. But the +4°C (39°F) stratum water is already at its densest and virtually incompressible at this temperature, so all it can do is to push out laterally, providing the springs with their flow. This action explains how springs can emerge from high mountain peaks at such cold temperatures, where there would be insufficient local collection for a gravity seepage.

Rain absorbs oxygen in its fall through the atmosphere. After it enters the ground and percolates through the soil, plant roots and organisms reduce its oxygen content. So when it eventually emerges as a true spring, the water is often oxygen-deficient, though rich in carbonic acid. It is dangerous to drink this water directly from the spring, for being hungry for oxygen, the water can steal it from susceptible organs, like the stomach, causing great discomfort. If breathed directly, the carbonic acid can damage the lungs. Known to mountain folk as 'damp-worm,' and by miners as 'choke-damp' respectively, both can be fatal. However, within ten metres of the source, the water has usually, through its active movement, absorbed sufficient oxygen to be quite safe to drink.

How springwater rises

Viktor Schauberger designed an experiment to demonstrate how groundwater rises during the day and recedes at night. The equipment consists of a glass U-tube with open ends, one of which has contact with the air only by two very fine capillary tubes, the other end being open. Each arm is sealed off from the other by some saltwater-saturated sand at the bottom of the U-tube. High grade springwater with low oxygen content, and having had no contact with strong light, is inserted into each arm. The U-tube is placed in a soil-filled bucket, containing ice at the bottom to create an artificial environment of +4°C (39°F) temperature.

When the bucket is put out in the Sun, a positive temperature gradient is set up and, because there is greater contact with the outside atmosphere, the water level can rise on the open end of the U-tube. At night, when the temperature gradient decreases, the water level rises on the side with the capillary tubes, falling on the open side, and rising on the partially blocked side. (This



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experiment is illustrated on p. 202 (Fig. 15.3), the experiment originally being designed to show how sap rises and falls in a tree.)

Producing energy from the ocean

Viktor Schauberger alluded to the simplicity of emulating the dynamics of true springs for generating energy, although he gave no details. Having gained some insight into Schauberger's thinking, Callum Coats described how this might be done, publishing the process, so that no commercial company would be able to patent the idea.

Describing the formation of true springs, we spoke of the deep groundwater having had its oxygen content removed by needy roots and organisms on its journey through the soil, but having instead a concentration of the female fructigenic carbonates. At its most dense at the +4°C (39°F) deep stratum, it is squeezed and can be lifted up to the highest mountain tops.

The water of the ocean deeps is in a similar condition of density at the +4°C (39°F) deep stratum, but also under high pressure because of the enormous weight of water above it. A long pipe would be lowered from the surface of the ocean to allow this oxygen-hungry water to rise in order to drive electric generators at the surface.

This would not be a viable system, however, without some essential additions that Schauberger added to increase the power of the rising abyssal water (Fig. 10.3). The pipe would be of double-spiral design, with vortex-inducing vanes similar to those used in the Stuttgart experiment (see Chapter 14). The bottom end of the pipe would have a tangentially-arranged vortex inducer, as well as a strainer to keep out marine creatures.

At a water level nearer to the surface, atmospheric air would enter through a one-way filter in order to introduce oxygen to the hungry abyssal water. (The filter would accept the smaller oxygen molecule, but exclude the larger water molecule.) On absorbing the oxygen, the rising water warms and rapidly expands with sufficient power to drive the generators, which would not be of the conventional design that destroys the water's structure, but with centripetal impellers that improve the quality of the water.²

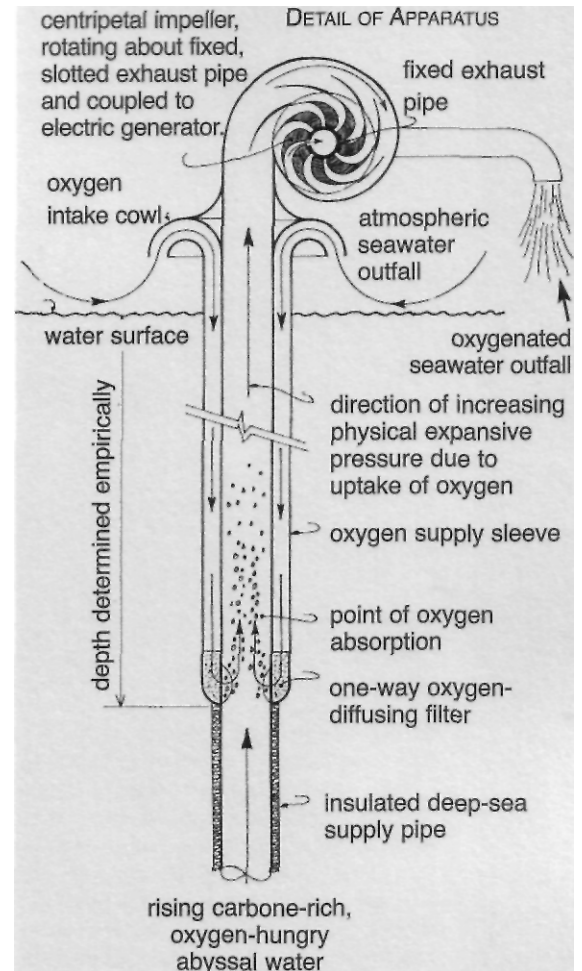


Fig. 10.3 (opposite). Free energy from the deep ocean.
Callum Coats' development of Viktor Schauberger's idea.

Fig. 10.4 (above). Detail of apparatus in figure opposite.

11. Rivers and How They Flow

If we understood the importance of water both for the environment and for life, we would nurture and protect our rivers, which are the great arteries of the Earth. Healthy streams and rivers are water at its most active, powerful and playful. In our ignorance of how water needs to move, we restrict rivers with embankments and other unnatural constructions. We treat rivers as sewers for waste, and we extract the energy and spirit from their form.

For scores of thousands of years, since people started to settle on the land, our forebears were aware that their prosperity depended on the river. Soils are quickly depleted of their nutrients by agriculture, particularly if intensive. Remineralization by regular flooding of the river was vital to obtaining good crops. This allowed the great civilizations to grow and flourish, in Mesopotamia, the valleys of the Nile, the Yellow River and the Indus, to name a few.

Today's technocrats have a need to control this apparently chaotic behaviour of the natural river, by steering the flow, sometimes behind high banks, and disregarding the ecosystem, to the great loss of fertility of the surrounding fields. Modern artificial fertilization (NPK — nitrogen, phosphorus and potassium) cannot take the place of Nature's remineralization; in fact it often causes great problems through creating imbalances and pollution.

Stages of a river

A river has three stages of life. Its youthful stage energizes the water as the steep landscape puts it through vigorous tumbling, spinning and intense vortical movements. The immature cold water is hungry, taking up minerals as it scours the rock, cutting gullies and steepening the sides of the valley, more especially when it is in spate. It is oxygenated in rapids and waterfalls. It is put through exercises that it will use well when it matures.

When the stream leaves the steep country, the flow slows, and some of the heavier rock matter it carried in suspension is deposited, to be picked up again when the flow accelerates. The water is now mature, having absorbed minerals and generative

energies, and if it is prevented from excessive warming by trees on its banks, it recharges the groundwater of the surrounding countryside. The richness of movement of the young stream is carried into the body of the meandering river. The water is creating its own form which in turn regulates its flow.

Entering the plains the river, in its natural way, would meander across the flat country, and when a bend twists back on itself, a shortcut will be created at flood time, leaving behind an oxbow crescent lake. It is in the plains country mostly that people try to manipulate the river, heavy with silt, by straight embankments to stop the river spreading where it wants to. These natural floods are not particularly destructive, and remineralize the soil which becomes much more productive. But technical man believes he can control Nature. The old river is now typically forced to perch sometimes 50 feet above the surrounding countryside. If the river should burst its artificial banks at this stage, the flooding is catastrophic. Lacking its normal twisting movement and positive temperature gradient which keep the silt in suspension, it is deposited, blocking the channel. Its natural path thus obstructed, it becomes angry and unpredictable. There are now very few major rivers which are allowed to flow naturally.

Temperature and the movement of water

Viktor Schauberger made inspired studies of the natural flow in rivers. He found that the temperature gradient in moving water plays a very decisive role both in the way it moves and in the structure of the water masses within the river.

To regulate a waterway by means of the riverbank itself is verily to fight cause with effect... It cannot and should not be the task of the river engineer to correct Nature by violating her. Rather, in all watercourses requiring regulation his job should be to study the natural harmony of the river, and to emulate the examples that Nature provides in the way of healthy streams ... Every violation, however, rebounds on the perpetrator ... As water flows down a natural gradient, it does so according to a sublime inner law whose power our hydraulic experts are quite unable to comprehend ... The more the engineer, ignorant of the nature of water, tries to channel water by

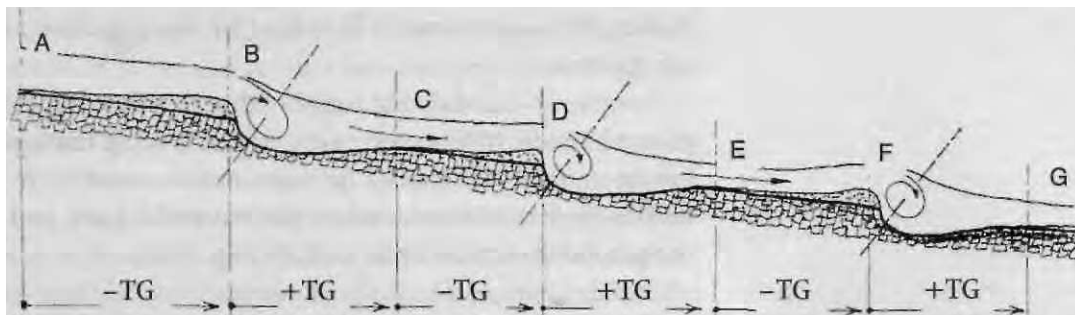
the shortest and straightest route to the sea, the more the flow of water weighs into the bends, the longer its path and the more destructive and the worse the water will become.¹

The variations in the temperature of the water-body are so subtle, within a range of 0.1 °C to 2.0°C (0.04°F to 0.08°F), that contemporary hydraulic engineering practice has never felt they were significant. Viktor Schaubberger, however, considered the temperature variation absolutely essential for all natural water resources management. He insisted that no artificial constraints on the river could ever be successful unless these variations were taken into account, since whether a river removes, transports or deposits its sediment is dependent upon the water temperature and the temperature gradient predominantly active along its course.

Creating a positive temperature gradient

When water descends a gradient, in the course of flow under natural conditions, it rhythmically first heats up and then cools down. The degree of heating depends on the amount of friction with the riverbed, the external temperature and the extent to which the water is directly exposed to the Sun. Only a minute change in temperature is required for water to pick up, transport or deposit its sediment, but the type of temperature gradient prevailing determines the action. A negative temperature gradient causes the deposition of sediment, and a positive temperature gradient provokes its removal. The temperature gradients alternating too suddenly can, however, cause the scouring or deposition of gravel to become chaotic.

Fig. 11.1. Alternate heating and cooling (breathing) rhythms in river flow. Friction with the river bed gradually warms the river (negative temperature gradient) so that it starts to deposit its suspended sediment. When this reaches its maximum, an overfall occurs, producing a horizontal barrel vortex that cools the water (positive temperature gradient), until the river gradually warms up again. Schaubberger likened this to the river 'breathing.'



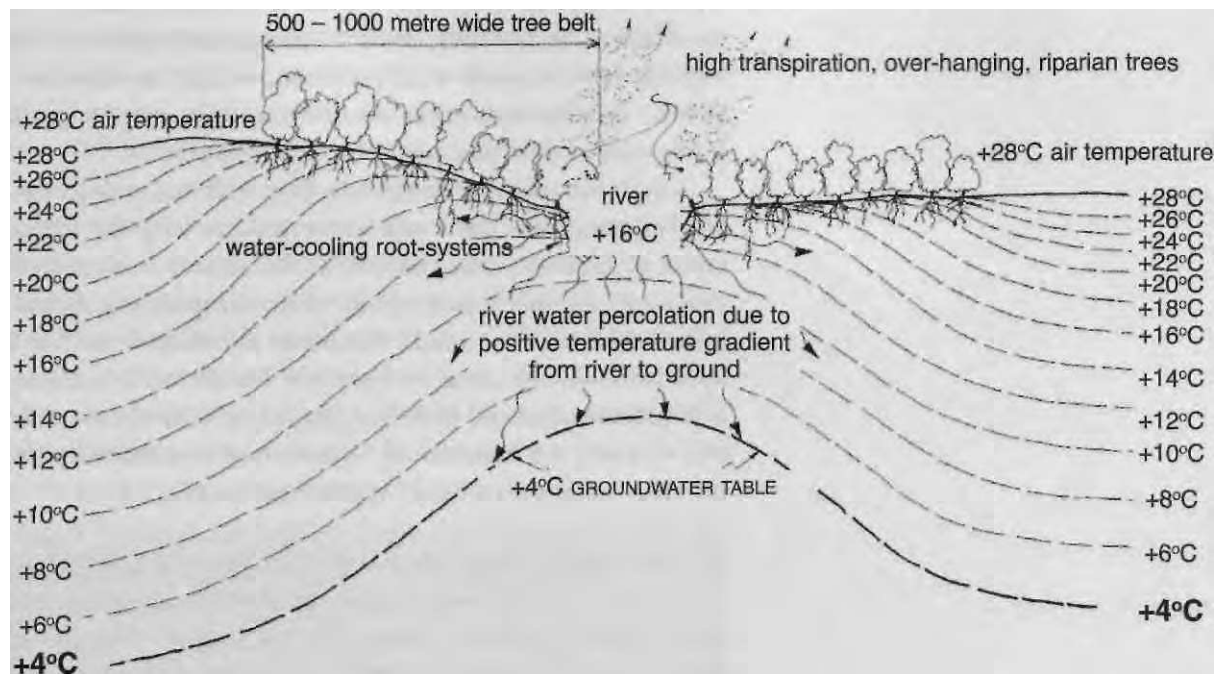
In Fig. 11.1, for example, from A to B the temperature gradient is negative. From A to B the water gradually heats up and in the process is unable to retain the sediment in suspension and drops it progressively as the water becomes warmer. At B, the zone of maximum deposition, the accumulated material results in an overfall that, in turn, creates a horizontal barrel vortex immediately downstream. This vortex, however, cools the water and therefore from B to C the temperature gradient becomes positive. The sediment is once more picked up and transported. Upon reaching C, the effect of the positive temperature gradient gives way to its negative counterpart and the suspended matter is again dropped, reaching a maximum at D.

This pulsation or alternation is like breathing; a positive temperature gradient representing the inbreath, the absorbing, material-collecting movement; the negative temperature gradient representing the outbreath, where the energetically transformed matter is exhaled from the system and deposited. In order to regulate a river naturally and successfully, it is essential to study the alternating sequence of the temperature gradients. A stretch of river with a positive gradient is less likely to flood, since only minor sediment deposition will occur. If the danger of flooding is to be reduced then a positive temperature gradient must be recreated or its duration extended. This can be done in four principal ways:

1. By shading and cooling the river through the replanting of trees, particularly at the bends, where the friction and therefore the warming tendencies are greatest. Tree species with a high evaporation rate should be planted. Through evaporation the sap in the tree is cooled and circulates down to the roots under the river bed, cooling the water as well. This kind of tree therefore acts like a refrigerator.

In order to maintain the health of the river, there should be a belt of trees 500 to 1000 metres wide. Rivers flowing through cleared, barren countryside should be reforested in order to re-establish healthy flow conditions, restore the nutrient supply and recharge the groundwater table in its vicinity (Fig. 11.2).

2. By the construction of appropriately designed dams in which the temperature of the discharge can be controlled according to the



prevailing air temperatures and the water temperatures of the flow downstream.

Current practice with most dams and water storage facilities is to release either cold bedwater from the bottom sluices or warm surface water over the top of the dam wall, down the spillway. This can have disastrous consequences unless the temperature of the water released or its possible effect on the downstream flow regime is taken into account. Warm water, for example, discharged into a stretch of river where the temperature gradient is only slightly positive, will effectively cancel the effect of the positive gradient, resulting in the automatic and almost simultaneous deposition of silt and sediment. The result will be flooding.

On the other hand if only the cold bedwater is released, it may overcool the lower reaches, causing excessive scouring and the transport of very heavy sediment loads which the lower flow regime may be unable to handle. This may be because of the slope of the bed-gradient and thereby the speed of flow, the width of the channel — wide, shallow channels dropping sediment more quickly, the temperature gradients operative lower down, etc. Each

Fig. 11.2. Groundwater recharge through river bank reforestation. The trees act like a refrigerator, cooling the ground, which allows a positive temperature gradient to draw water from the river to recharge the water table.

type of discharge eventually produces the same results — silting up followed by flooding. Such discharges also produce what has recently been termed 'cold pollution,' which can destroy downstream fish life and other aquatic creatures due to the sudden influx of far-below-normal water temperatures.

Viktor Schauberger designed a dam with outlet sluices at different heights on the dam wall to correspond with the temperature layers of the dam water (warmer at the surface, coolest on the bottom). An automatic monitoring of air temperature would determine which outflow would discharge the water from the dam at approximately the same temperature. The aim of this arrangement is to remove large and therefore disruptive temperature differences and to bring the external air temperature and the temperature of the river water into a closer approximation (Fig. 11.3.).²

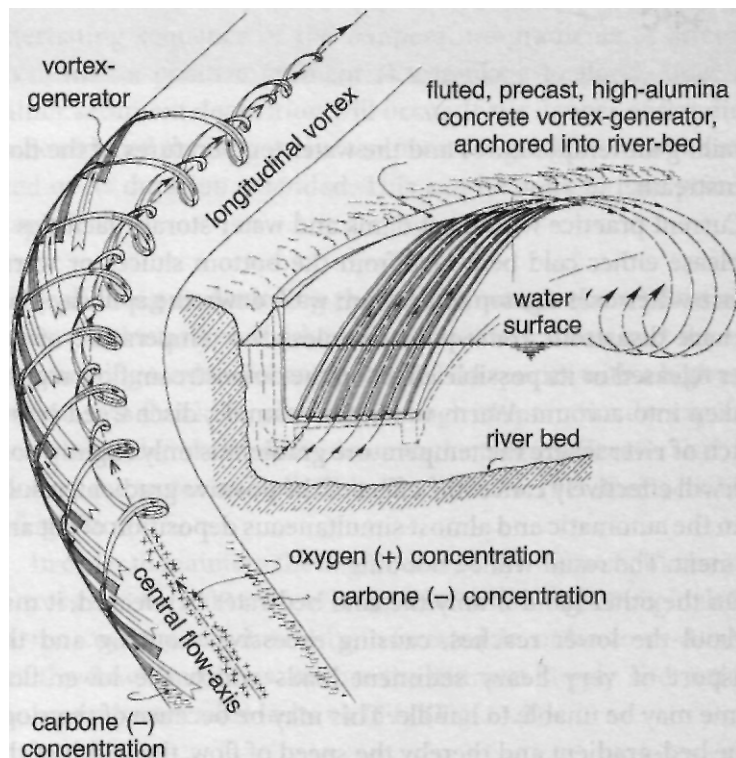


Fig. 11.3. An ingenious (but complex) method of freshening and re-energizing a river.

By installing pre-cast concrete guide vanes that generate a cooling longitudinal vortex on a river bend, which brings the growth-enhancing substances (carbones) on the riverbed and near the banks into contact with the oxygen in the centre-stream; the accumulated energies from this synthesis release nourishing sales into the river banks between the bends.

3. By installing flow-deflecting guides which direct the flow of water at the bends towards the centre of the river and simultaneously cause the creation of cooling longitudinal vortices. Viewed along the direction of flow, these induce anti-clockwise rotating vortices at left hand bends and clockwise vortices at right hand bends.

The flow-guide or vortex generator (see Fig. 11.3) is made of pre-cast concrete, its curved surface fluted with grooves running parallel to the direction of flow, to prevent any lateral slip. It is triangular in shape, the apex pointing downstream. The wider, upstream end of the triangle is horizontal and flush with the riverbed, so as to scoop up the onflowing water and curl it over centripetally (inwardly spiralling) into a vortex in the centre of the channel. This movement gathers up the suspended and dissolved growth-enhancing substances (carbones), from near the banks and the riverbed, allowing them to mix with the dissolved oxygen which in all healthy streams collects in the central flow axis.

These (negatively-charged) fructigenic carbones become energized when moved centripetally and are thus able to combine with the fertilizing (positively charged) oxygen. The oxygen is cooled by a positive temperature gradient, resulting in a freshening and reinvigorating of the water. At the shallower parts of the river between the bends, the accumulated energies from this organic synthesis allow the discharge of nourishing salts into the groundwater in the banks.³

4. By the implanting of 'energy-bodies' in midstream, anchored to the river bed, which re-energize the water by forming natural longitudinal vortices. These would be used where the flow-guides are inappropriate — in the straighter stretches of a channel for instance — and where the removal of sediment is desirable. Although never described by Viktor Schauburger in detail, these could take the form of egg-shaped longitudinal vortex-generators with neutral buoyancy achieved through small holes allowing penetration of the outer water. Schauburger may have applied this principle from observing the stationary trout.

Vortices may also be introduced by placing large (preferably metalliferous) boulders in the centre of the channel. Schauburger found that the boulders that 'floated' in a very cold stream contained metal oxides and silicates, so these stones would actually increase the

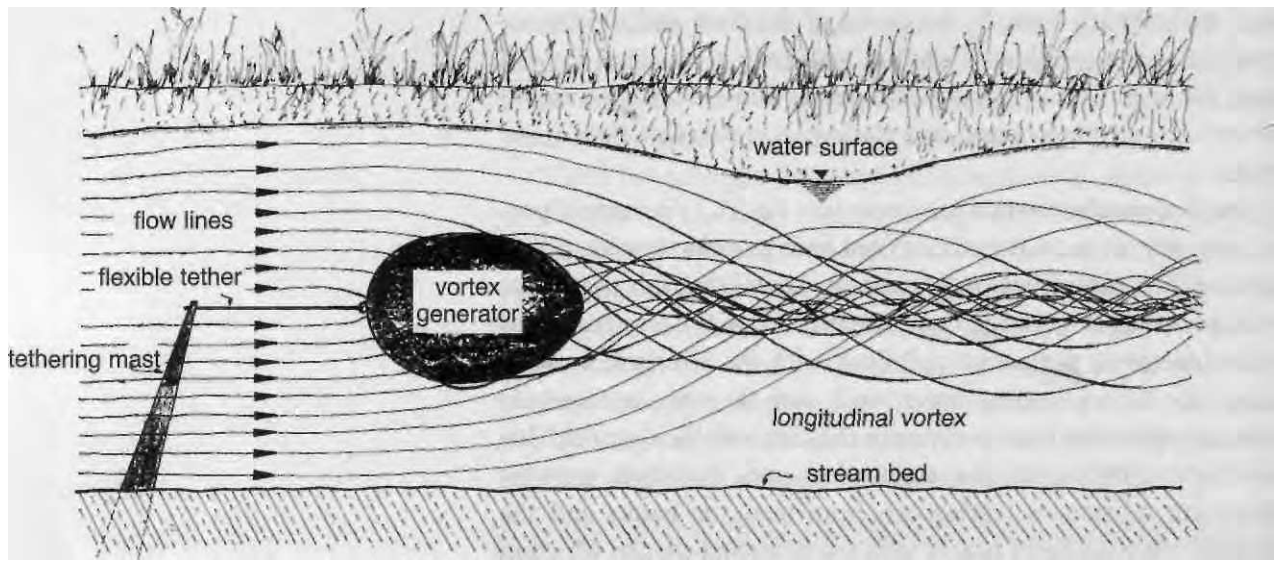


Fig. 11.4. An egg-shaped body to generate longitudinal vortices.

Another way to increase vitality and electrical charge in streams.

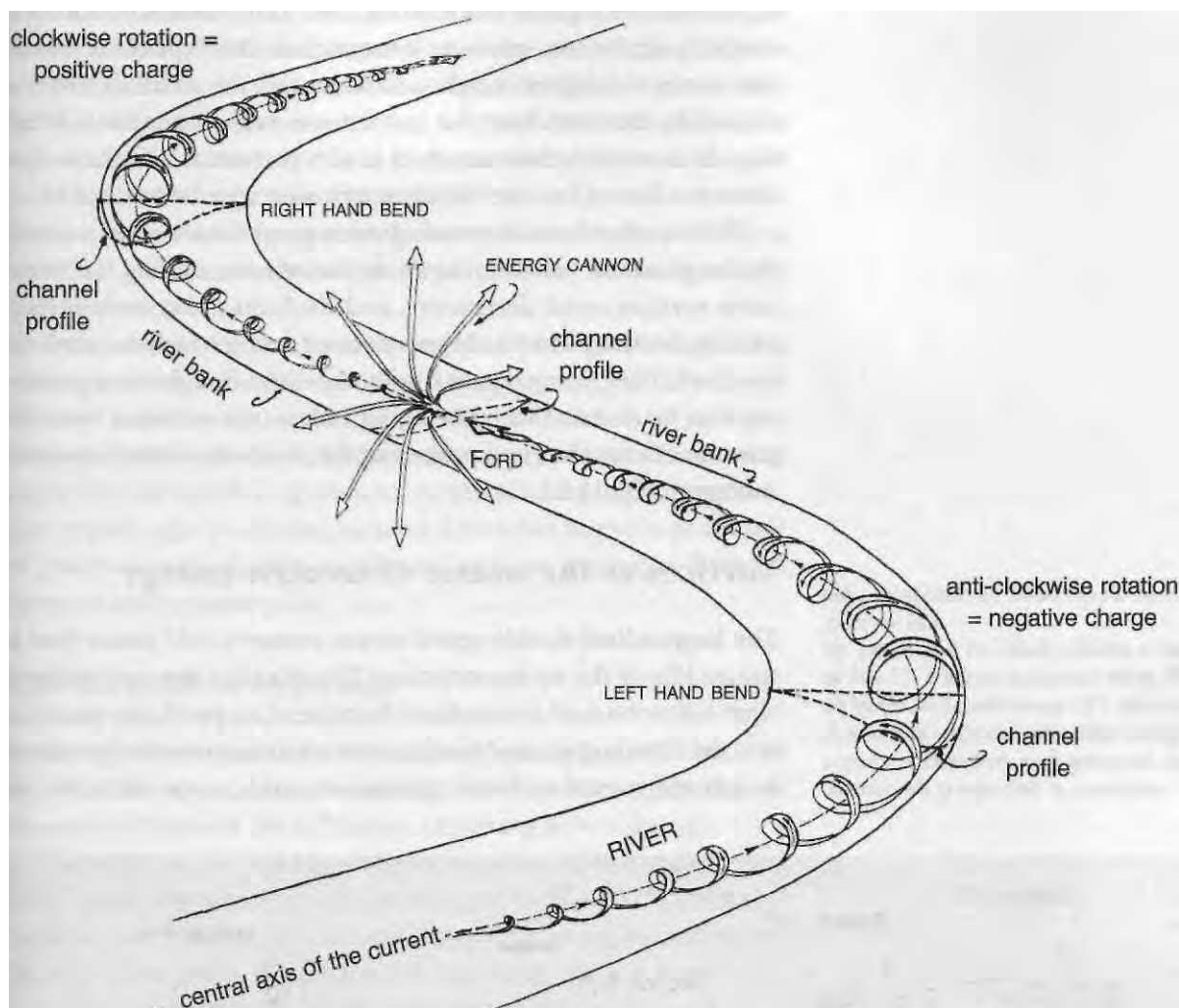
energy of the water. Water carries an electric charge. If the water is caused to rotate, a biomagnetic field would be created which would enhance the vitality of the life-enhancing elements (fructigens, dynagens and qualigens) and therefore the general health of the water.

Schauberger once admitted making use of 'energy-bodies,' when he secretly installed them during the night in a sediment-choked stream. By morning the sediment had disappeared, the channel bed deepened considerably and the natural flow of water restored. The engineers in charge of the stream's regulation were amazed.

The formation of vortices and bends

We have seen that energy is always connected with movement. The natural movement of water is sinuous, convoluting and vortical. Without such movement there is no polarity. Vortices, however, cannot form without the existence of polarities. Through the action of vortices come rhythms, the pulsations that act as a gateway — a breathing process that the river performs for the environment.

There are three kinds of vortices that form in a river. The principal one, responsible for the river's health is the longitudinal vortex (see Fig. 8.2) which is naturally generated at river bends. The coldest water filaments are those closest to the centre and they,



being subject to the least turbulence, move fastest, pulling along the outer water filaments in their wake. The outer water filaments create the turbulence that keeps the riverbed clear of silt, becoming infused with trace elements and nutrients, and building up its internal charge of pure energy that is released as the longitudinal vortex weakens (Schauberger called this release the 'energy cannon').

Then there are the transverse vortices that form at right angles to the bank. These are caused as a lower layer of laminar-structured water slips faster than the layer above it. These mix the water, but at the same time cool it, because the water temperatures within the centre of these vortices are identifiably cooler than those without, the

Fig. 11.5. Energy release in the environment.

As the longitudinal vortex forms at a bend in the river (see Fig. 11.3), the water cools and grinds sediment, releasing nutrients into the river; when the vortex slows down after the bend, the water warms in the now shallower riverbed and begins to deposit its store of nutrients and trace elements; then just before a new vortex starts to form in the reverse direction at the next bend, energy is released into the environment; Viktor Schauberger called this the 'Energy Cannon.' If the river has been badly regulated, this discharge could be of damaging energy.

uppermost vortex train manifesting itself as the familiar backward-breaking ripples seen on rivers at the surface. This type of vortex also distributes the lighter weight sediment and the nutrient material carried by the river from the centre towards the river bank. While they do increase turbulence, their action is more as a brake to slow down the flow of the river which might otherwise be too rapid.⁴

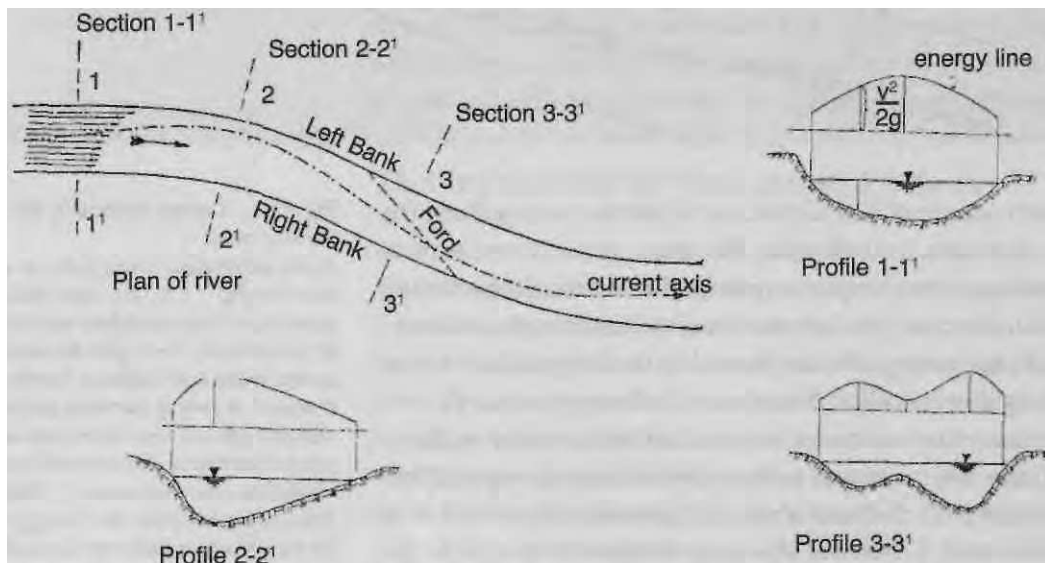
On the other hand, increasing water temperature often weakens the longitudinal vortices, the rising turbulence making the transverse vortices more destructive, and the banks may be breached, causing flooding. The third type of vortex acts vertically towards the river bed. They may gouge out potholes with a boulder as a grinder, but can be destructive by bringing radon-type energies from the ground into the river and projecting them into the immediate environment. (Fig. 11.5.).

Vortices as the source of creative energy

The longitudinal double-spiral vortex creates a cold dense flow in the middle of the vortex structure. This is called the core-water, or what Viktor termed an 'emulsion because of its particular qualities. It is the breeding ground for the most vitalizing energies produced by natural river flow. Finely ground minerals, trace elements and

Fig. 11.6. River bend formation in plan and section.

If the river is initially shaded on both banks, the profile of the channel at section 1-1' will be symmetrical. The curved line at the top of the diagram reflects the velocity of flow at each vertical, increasing from the banks, reaching a maximum at the centre of the channel.



organic substances are spun into this belt of rapidly rotating core water (emulsified) that is composed to a large extent of ionized elements. What this does is to enable new combinations and recombinations of the various elements and suspended substances. This is a process that Viktor called 'cold fermentation,' which is very much associated with longitudinal vortices. These are beneficial because the cooling makes the oxygen and silicates more passive and able to combine with carbonates, which then produce a fructigenic or growth-promoting effect.

Overheating of the water creates other types of vortices that are not so beneficial. These might be vortices forming laterally across the river (transverse vortices), or vertical vortices ascending to the surface from the river bed. In these the oxygen is heated, becoming aggressive, and producing low quality, germinating-inhibiting energies or pathogen-producing bacteria. This often happens as a result of poorly conceived river regulation, and can propagate harmful energies to the countryside.

The formation of bends

A river will always follow a sinuous energy-generating path, because this is in its nature, unless mountains or other immovable objects prevent it. Rivers are the mirrors of an unseen flow of energy.

The water on the right bank heats up where it has been exposed to the Sun's heat (see Fig. 11.6 section and profile 2-2¹); the water becomes more turbulent and begins to decelerate compared to the main body of water. The water flowing along the left-hand bank which is cooler and faster moving then overtakes the slower moving water and curls towards the right around it, due to the increasing turbulence and deceleration of the warmer water, eventually creating a bend. The faster flow will pull the heavier sediment centrifugally to the left, while sediment on the right is scoured out by the colder water. Meanwhile at this point the cross-sectional profile of the river becomes asymmetrical, due to the varying flows and temperatures, the coldest water flowing in the deeper section of the channel.

The cold water now flows on the other side of the channel; a bend is formed in the opposite direction due to the momentum of the cold water-masses, (see section and profile 3-3¹). This rhythm of the river changing its course from left to right and right to left is an integral part of its pulsating flow. It is our interference of this

rhythm that causes the river to become aggressive and flood. The banks will then not receive their recharge from the river, and all life downstream will also suffer. Should any kind of adjustment have to be made to the course of a river, it is essential to know when to encourage a right hand bend, for to put a left hand one there would only disrupt the river's energy flow. Even on a long left or right hand bend, there is still an alternating left-hand right-hand motion, although the motion in the opposite direction to that of the bend may be very slight and of short duration.

This current crossover appears where the river is most shallow and where the slowing down of the flow allows suspended material to settle. So these fordable stretches become the major deposition zones for the river's suspended nutrients and minerals and where the river can transfer these to the river banks. Alternatively the bends are where the rocks and stones are ground down, the trace elements contained in them being taken up by the vortical flow for later nourishment. Viktor Schauberger used to say that this sediment actually helps to sustain the river in its wanderings towards the ocean; he called it 'the river's bread.' These vital nutrients will be absorbed into the groundwater table.

This fordable stretch is also the place where the energy nutrients created by the river are released into the environment, provided there is a positive temperature gradient in relation to the river bank. As noted above, Schauberger called it the 'energy cannon' (Fig. 11.5). It is the completion of the 'outbreath' part of the cycle. All the energies accumulated in the previous in-winding, longitudinal vortex have to be released before the water rotates in the opposite direction. By this means a river constantly renews its vitality and enriches the land through which it flows.

If the water is sufficiently cold, dense and dynamic, small particles of trace elements and minerals are released from these suspended stones as they grind together, and are partially or wholly dissolved, replacing those previously lost through transfer to the surroundings. In addition pure ionizing energy is released through the generation of the triboluminescence. A golden flash of light is produced when two crystalline stones of similar composition are struck against one another. As it takes place under water it cannot be related to normal combustion, electrical discharges or frictional heat, and must therefore be a process of cold oxidation not associated with the generation of heat.

HIDDEN NATURE

This is probably the origin of the fabled 'Gold of the Nibelungs,' the 'Rhinegold' that supposedly lay on the bottom of the Rhine in days of yore and which gleamed during the hours of darkness. This legend is also to be ascribed to the phenomenon of triboluminescence. About 200-250 years ago, the water of the Rhine was probably clear enough for people to observe what appeared to be the flashing of gold on the riverbed. The Rhine today, however, is a thick, turbid, grey-green muddy brew, its life force having been extinguished by modern mechanistic methods of river engineering.

Conventional river engineering

Viktor Schauberger's most vigorous campaign was to try to persuade the Bonn government to restore the Rhine and the Danube to their natural courses. He was greatly disturbed by the way in which those mighty rivers' banks had been straightened, so that the water was not able to flow naturally. It was like constraining someone in a straightjacket. This had the effect of overheating the oxygen content, making it aggressive. The water becomes violent, prone to flooding and disease-promoting. Tree felling on the river banks has only exacerbated the problem.

Often the rivers have been regulated through trapezoid-shaped canals in the misplaced belief that the flow would be improved. In fact this almost lifeless body of water was unable to carry its sediment, which settled on the bottom, and the river has to be constantly dredged. Because the flow is uniform, no cooling longitudinal vortices can form and no energizing processes can take place.

The water becomes warmer, sluggish, insipid and murky. With its energies destroyed it becomes a stale and lifeless liquid. Instead of being a carrier, mediator, accumulator and transformer of life-energies, the river has become a corpse (Fig. 11.7).

Hydroelectric power

Present methods of hydroelectric power generation destroy water in their own way. The present inappropriate design of dams we touched on earlier in this chapter. The water is thrust down cylindrical pipes under enormous pressure. Upon leaving these it is then hurled against steel turbine blades where it is smashed to

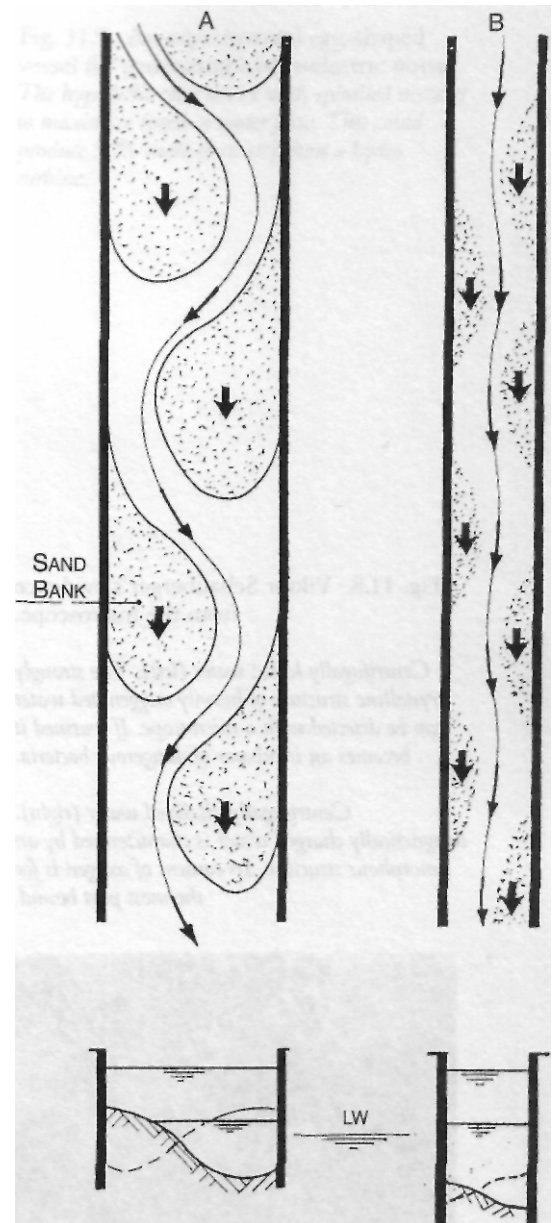


Fig. 11.7. Sand banks in conventional channels.

From a textbook of conventional river engineering. The river still tries to dance and play, but confined to a straightjacket, it silts up and will have to be dredged, to avoid flooding.

smithereens. The physical structure of the water is literally demolished and all the dissolved oxygen, and even some of the oxygen in the water molecule itself, is centrifuged out of the water.

Viktor Schauberger had photographs taken through a microscope (Fig. 11.8) that show the marked difference in the structure of water that has been subjected to centrifugence on the one hand and centripetence on the other. The fragmented appearance of the centrifugally moved water is unmistakable. The slicing action of the blades causes severe friction and heating which makes the oxygen highly aggressive and it attacks the bare metal, severely pitting the surface, often destroying the blades' efficiency.

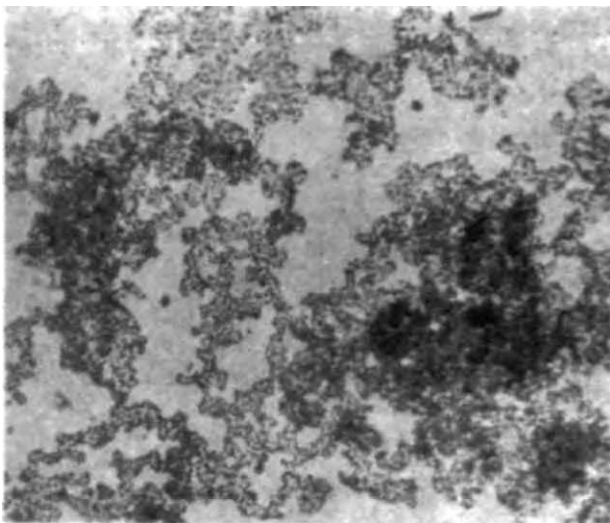
This fragmented and largely oxygen-deficient water, a virtual skeleton of healthy water when forcibly expelled into the river, has disastrous consequences for the fish and other aquatic life. Inevitably certain species of fish disappear once these power stations are commissioned, and other forms of life survive with difficulty.

The water is so depleted that it has to build itself up again completely before it can be of any benefit to the environment. So it seeks out new supplies of oxygen and other high quality substances wherever it can find them, including living things. With their particularly intimate contact with this 'ravenous' water, fish are especially prone to attack as it enters their very delicate gill systems and their body's tissues are attacked by oxygen-hungry carbonates. The soil bordering on the river is also leached of its

Fig. 11.8. Viktor Schauberger's evidence from the microscope.

Centrifugally killed water (left). The strongly crystalline structure of heavily oxygenated water can be detected with a microscope. If warmed it becomes an incubator of dangerous bacteria.

Centrifugally vitalized water (right). Magnetically charged water is characterized by an amorphous structure. Its content of oxygen is for the most part bound.



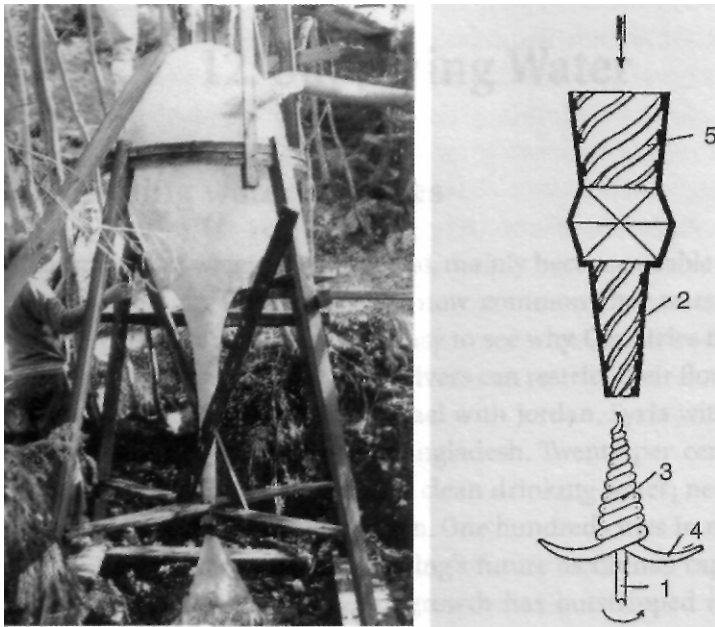


Fig. 11.9. An experimental egg-shaped vessel for generating hydro-electric power. The hyperbolic cone device with spiralled nozzles to maximize speed of water flow. This could produce 90% more electricity than a hydro turbine.

nutrients which the water hungrily consumes resulting in a large drop in soil fertility and productivity.

Viktor Schauberger showed how unnecessary is this extraordinarily destructive power-generating process. He devised a novel method in the early 1920s which can produce 90% more electricity from a given flow-volume without harm to the water. Using water from a nearby stream Viktor installed this device to light his forest warden's house, which was too remote to be connected to any other source of supply. The design shown in Fig. 11.9 is very simple, illustrating his belief that what is natural is silent, simple and cheap.

It operates by water being cooled, densified and energized as it passes through a rifled brass nozzle, in a vortical flow, thereby reducing both pressure and friction as the water is centripetally drawn away from the sides. The water is directed against a multiple-spiral, shell-like impeller attached to the shaft of a generator.⁵

12. Supplying Water

Dwindling water supplies

The subject of water is very topical, mainly because usable water is in short supply. Predictions are now common that wars will be fought over access to water. It is easy to see why. Countries that control the headwaters of important rivers can restrict their flow downstream, like Turkey with Iraq, Israel with Jordan, Syria with Israel, Sudan with Egypt, India with Bangladesh. Twenty per cent of the world's population does not have clean drinking water; nearly half the world does not have sanitation. One hundred cities in northern China now ration water, and Beijing's future as China's capital has been under review because its growth has outstripped its water resources. Even those countries which have sufficient water treat it so badly that, when delivering it to homes, kill it with chlorine, fluorides and other chemicals, ostensibly to prevent disease; instead this depresses our immune systems and makes us more open to infection.

How has this come about? Water is in great abundance on this marvellous planet, but less than 0.5% is available as fresh water. The rest is salt water, inaccessible groundwater, or frozen in polar mountain ice. While the world's population is increasing by 85 million a year, cities are expanding at double that rate due to urbanization. Cities and industries consume the most water (industrial water consumption is to double by 2025).¹ Twenty-four countries, mainly in Africa, will not have enough water to meet 2025 projected needs.² And, if that is not critical, according to a recent UN report, world population could rise from 6.1 billion in 2000 to at least 8.2 billion by 2050.³ Today, 1.2 billion people drink unclean water, and 2.5 billion lack proper toilets or sewerage systems.⁴ And what will be the situation in ten years' time?

Globally, about 70% of water diverted from rivers or drawn from aquifers is used for irrigation. This is hugely wasteful; leaking pipes and channels, evaporation from reservoirs and from irrigation sprays means that about 60% of the water does not reach the plants' roots. China's greatest river, the Yellow River, has run dry and in several

years since 1985 has failed to reach the ocean.⁵ The once mighty Nile, Ganges and Colorado Rivers barely reach the sea in dry seasons.⁶ The introduction of industrial agriculture into India and Northern China has in those areas led to dangerous lowering of the water table.

The construction of large dams, whether for hydroelectric power or for irrigation does incalculable environmental damage, as well as annihilating viable human communities. Dams destroy ecosystems and sever the balancing of energy from one part of the landscape to another. Since 1970, when Egypt's Aswan High Dam came into operation, the number of commercially harvested fish species in the Nile dropped by two-thirds, and the Mediterranean sardine catch has fallen by 80%.⁷

Water for profit

Traditional societies know how to manage their water, but increasingly the supplies of rural communities are being privatized by companies whose major priority is profit. In April 2000 the protesting citizens of Cochabamba in Bolivia suffered over 180 casualties at the hands of their police before their government revoked the right of International Waters of London to impose a 35% increase in water prices. The Bolivian government has now reconsidered its policy to privatize all public water supplies.

Vast new networks of supply and disposal pipes must be built in the cities if basic water needs are to be met. Governments, unwilling these days to invest in social infrastructure, are privatizing water utilities, and the results seldom benefit the consumer. A shortage in any essential commodity brings out the profiteers and extortionists. Pro-privatization propaganda reached a climax at the Water Forum meetings in The Hague in March 2000, but the abuses and inadequacies of commercial control have become apparent.

One study has shown that Swedish municipal water authorities delivered water at around a third of the cost, had operating costs of about half, and produced nearly three times higher return on capital than English private water companies of similar size.⁸ However, since the economic downturn of 2001, several English private water companies have been experiencing financial difficulties. It makes complete nonsense that essential water supplies should be subject to the ups and down of the financial markets.

A great danger to our water comes from the globalization of sup-

ply. Multinational companies are unaccountable and self-serving with more interest in profits than in a sustainable environment. A group of water companies tried at the 2001 Water Forum conference to foist a new water order on the world, in effect to encourage water supply to be removed from public control. American companies are negotiating to build dams in India which would displace countless communities and destroy their environments. Three French companies already control more than 70% of the world's private market.⁹ Increasing numbers of privatized water schemes are linked to ventures to extract more water through vast dams and reservoirs, with bulk water supply schemes that guarantee profits by requiring consumption regardless of need.

Modern water treatments

Chlorination

Because public water is not treated with the care required to keep water pulsating and alive, it degenerates, attracting pathogenic organisms. As a result, the authorities routinely treat it with chlorine to prevent the threat to the community of waterborne diseases. This powerful disinfectant removes all types of bacteria, beneficial and harmful alike, and in doing so, over a long period of time, destroys or seriously weakens many of the immune-enhancing micro-organisms in the body. It is a major contributor of lowered immune resistance in older people. Medical authorities say that the amount of chlorine is so small that it could not do this, but they fail to take into account that the chlorine accumulates in the fatty tissue of the body, so that the dosage is cumulative, nor that there is a homeopathic action that amplifies the effect on the body.

Those of us who live in cities and are forced year-in and year-out to drink sterilized water should seriously consider the fate of that 'organism' whose naturally-ordained ability to create life has been forcibly removed by chemical compounds. Sterilized and physically-destroyed water not only brings about physical decay, but also gives rise to mental deterioration and hence to the systematic degeneration of humanity and other life-forms.¹⁰

Fluoridation

The issue of adding fluorosilicates (fluoride) routinely to drinking water is one of the worst outrages in public health policy. This is not

the naturally occurring calcium fluoride that is present in some drinking water, usually at low levels of about 0.1 ppm (parts per million). It is a by-product of a number of industrial processes, initially the iron, copper, aluminium and now the phosphate fertilizer industries, and contains also a number of heavy metals; altogether a potent toxic cocktail, the disposal of which would be costly by current environmental standards.¹¹

The solution to this problem of industrial waste disposal was to arrange for their addition to public water supplies. In parts of the USA, Canada, Britain, Ireland, Australia, New Zealand, and a few non-English speaking countries, like Chile, this is permitted, usually at levels of about 1 ppm (or 1 mg fluoride per litre of water), but many other countries decided the risks were too high to implement the policy. The addition of fluoride as a policy is justified by the claim that it reduces dental cavities, especially in children. Independent research actually proves otherwise, and shows that the body accumulates levels of fluoride in the bones and certain organs, and there is evidence of increased risk of cancer, brain function impairment, kidney malfunction and premature ageing.¹² At higher dosages, fluorosilicates are an effective rat poison.

Unfortunately fluoride is also added to many processed foods, fruit juice, milk and, especially toothpaste. Fluoride is released into food cooked in Teflon-coated cookware, so the actual intake may be significant, even if you don't live in a fluoridated area. For reasons that are difficult to comprehend, but which are clearly political in nature, many dental and health authorities seem to support this mass medication of whole populations, and politicians seem happy to go along with it.

Mass fluoridation started in the USA in 1945, backed largely by the Mellon family, owners of ALCOA, the biggest aluminium manufacturer, and one of the biggest fluoride wartime polluters. Starting with Grand Rapids, Michigan it was introduced within two years to a hundred cities. Basically a dirty tricks campaign that labelled opposers as crackpots (and during the McCarthy era as left-wing subversives), it has never completed convincing tests, nor produced adequate evidence of its efficacy or safety. 'It was a political, not a scientific health issue' and, like the agenda of the more recent genetically modified foods campaign, became a major US export.¹³

The World Health Organization and the American Medical Association were persuaded to back the policy. The FDA (US Food and

Drug Administration) has backed off slightly from its 100% endorsement of the product, due to public exposure of the scam, but today 130 million Americans in 9,600 communities continue to drink fluoridated water.¹⁴ Like the USA, about 50% of the Canadian population has fluoridated water.

Mass fluoridation came to Britain in the 1950s, and currently 10% of the population is exposed, mostly in the West Midlands and the North-East. The present UK government policy is to require all water companies to adopt fluoridation. In Australia, some of the fluoride laws are so Draconian that people may be prosecuted for speaking out against water fluoridation.¹⁵

Barry Groves concludes, 'Fluoridation is the longest, most expensive and most spectacularly unsuccessful marketing campaign ever to come out of the United States.'¹⁶

Viktor Schauberger was very concerned about industrial pollution of rivers and lakes, but the addition of poisons to our domestic water supply was not an issue of the 1930s. Indeed, he insisted that the way we transport and deliver water destroys the invigorating qualities of healthy water, and he pursued enlightened research on ways of maintaining water's energy. Viktor predicted that one day a bottle of good water would be more expensive than a bottle of wine, and commented on our treatment of public water supplies:

If we have any common sense remaining, we should refuse to continue to drink water prepared in this way. The alternative would be degeneration into cancer-prone, mentally and physically decrepit, physically and morally inferior individuals.¹⁷

Transmuting water's memory

Most communities make genuine efforts to remove physical pollutants from public water supplies, but there are so many organic toxins produced by industrial agriculture, that one is wise to consider good filtration to reduce the dangers of these pollutants and of heavy metals that, sadly, are now more common. There are now generally available good and affordable plumbed-in filters that remove most of the physical contaminants.¹⁸ However, what our water treatment policies must urgently take on board is that the physical removal of a pollutant is only part of making water safe.

Typically, in modern cities, public water supplies are recycled as many as twenty times. Even if the physical contaminants have been removed, their vibrational imprint is still carried in the water in its memory bank, no matter how many times it is recycled. Just as water can carry restorative energies, such as in homeopathy, so it can transmit negative or destructive imprints that can cause disharmony or disease in the body.

The purpose of some of the better vortex treatment systems is to recluster the water, in a manner that superimposed natural vibrations will erase the memory of the water's previous abuse. The vortex, being the transmuting instrument or enabling gateway between different qualities or levels of energy, allows the water to absorb the etheric or cosmic level of energy that surrounds us all.¹⁹ Rather as allowing brilliant sunlight and fresh air to fill a musty room will quickly transmute the stale energy, so the more refined energy always prevails over the coarser. We would recommend a combination of an efficient plumbed-in filter with a vortex-type re-energizing system (see Resources, p. 276).

Tubular water movement

We described earlier Viktor Schauberger's almost mystical experience of when he felt his own consciousness enter the stream and how the water consciousness seemed to tell him how it wanted to move. Great pioneers of science have told of similar experiences as a kind of initiation. For Viktor it opened a wider perception about water's behaviour in quite different situations. For example, how water wants to move in a closed system like a pipe is quite different from its movement in a river. His genius allowed him to make the quite remarkable connection between the behaviour of water in a pipe or tube, and the movement of sap in a tree or blood in the human body.

Water main material

Archeological research has shown that in ancient times, from the Babylonians to the Greeks, there was a greater understanding of water and its qualities. In those times, water mains were constructed of high quality wood or of natural stone. In time, these natural materials became more scarce, and the Romans experimented with different metals. Preoccupied with oxidizing corrosion, unfortunately they

often used lead which brought its own problems of lead poisoning, particularly in the wine goblets where the vinegar in the wine dissolved the lead.

Before the expansion of cities during the Industrial Revolution, many water mains in Europe, and even in New York, were constructed of wood, which allowed the water to breathe and to interact with its environment. After the water mains in Vienna were extended to new suburbs with steel or iron pipes, internally coated with tar, as opposed to the traditional wooden tubes, Schauberger found that the incidence of cancer more than doubled between 1920 and 1931.²⁰

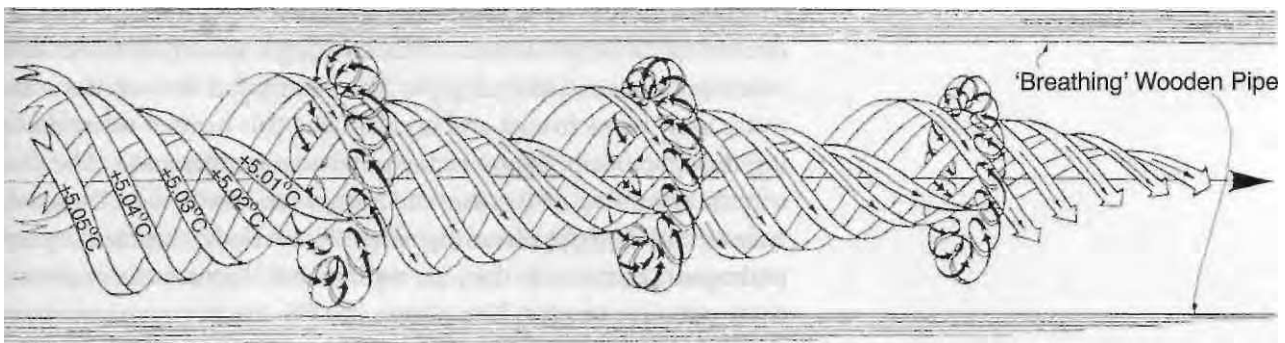
The laminar structure of water quickly disintegrates owing to the chaotic flow through a cylindrical pipe. Friction with the pipe walls heats up the water, decomposing the dissolved trace elements. As the surface of the iron pipes start to rust, oxygen is taken out of the water, and the rust deposits encourage disease-promoting bacteria. The accumulating rust in turn constricts the water flow, so that what is delivered is dead water, disinfected with chlorine.

The wooden water main

Schauberger knew that water can maintain its vitality and energy only if it is allowed to tumble about in a spiralling vortical manner. So in 1930 he set about designing a pipe that would actually encourage this movement. It was constructed of wooden staves, like a barrel, which allowed the moisture to seep through, transferring a cooling effect (as in sweating) to the water in the pipe. The spiralling movement was created by a series of guide vanes, which act like rifling in a gun barrel. These were made of silver plated copper to

Fig. 12.1. The double-spiral longitudinal vortex.

This is a longitudinal vortex showing the development of toroidal counter-vortices. These occur due to interaction with the porous pipe walls and have an effect similar to ball-bearings, enhancing the forward movement. Their interior rotation follows the direction of rotation and flow of the central vortex. These toroidal vortices transfer oxygen, bacteria and other impurities to the pipe walls, where the concentration of oxygen destroys the inferior, pathogenic bacteria.



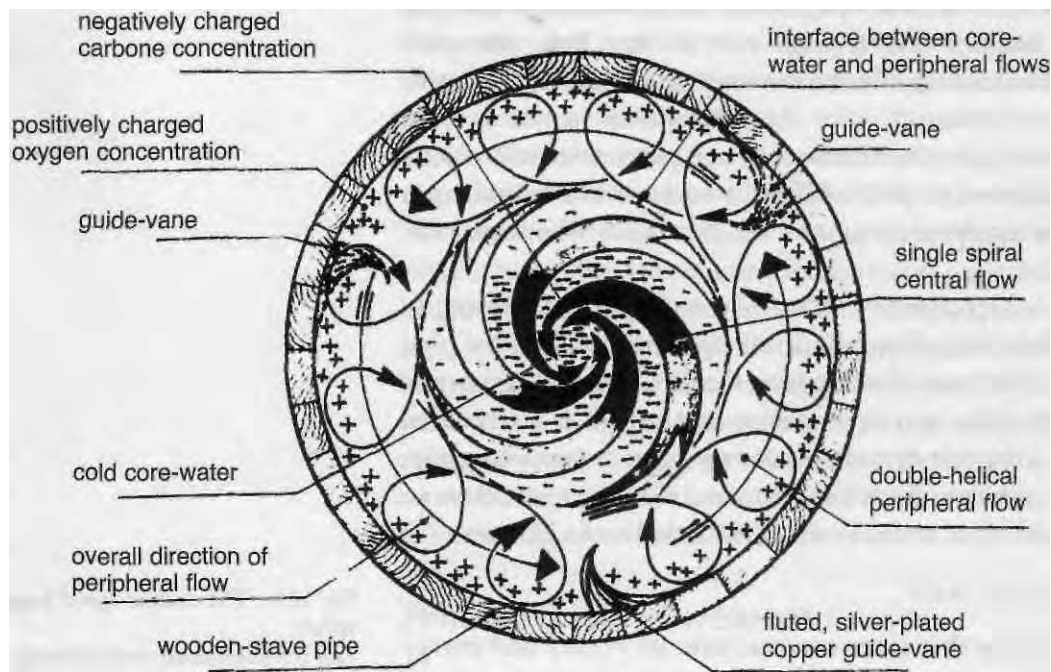


Fig. 12.2. Flow dynamics of the double spiral pipe (cross section).

enhance the subtle energies²¹ and fluted so as to direct movement towards the centre, thus reducing the heating effects of friction.

Figs. 12.1 and 12.2 illustrate how this configuration sets up a double-spiral longitudinal vortex, creating a waterflow faster than a conventional cylindrical pipe. The centripetal flow of the main water body helps to cool and accelerate it, this heavier water drawing the specifically lighter outer water along in its wake. The centripetal spiralling of the toroidal 'doughnuts' created by the guide vanes extract oxygen from the main water body, transferring any pathogenic bacteria to the pipe walls where they are eliminated by the aggressive oxygen. The higher quality micro-organisms however, survive, because they require higher levels of oxygen.

HIDDEN NATURE

It is a brilliant design that imitates the natural pulsating flow of water in a natural vessel and which delivers water that purifies itself and cools through its motion, eliminating the need for any sterilizing or purifying additives. Ideally, these wooden water mains should be embedded in sand, allowed them to breathe, and protected from light and heat. In such conditions they should outlast a steel pipe.

The Stuttgart tests

As the scientific establishment had never taken seriously his ideas on natural water movement, Viktor Schauberger in later life decided to have them subjected to rigorous tests by an independent authority. In 1952 he asked the Stuttgart Technical University to set up the experiments at his own expense. He approached Professor Franz Popel, director of the Institute of Hygiene who, knowing Schauberger's infamous reputation, at first refused, saying it would be a waste of his time.

The German Government had been irritated by Viktor's railing about its management of the River Rhine. So, hearing about Schauberger's proposal, it was happy to offer to cover half the costs, thinking that any genuine tests were bound to discredit him. As a result of this, Professor Popel changed his mind and agreed to test the various rifled and helical pipes that Viktor supplied.

The object of the tests was to compare how water moves through eight different kinds of pipe, the velocity of the water flow being affected by friction varying according to the form of the pipe. The configurations that produced the most friction were the straight pipes made of glass or of copper. Introducing a sinuosity to the pipe reduced the friction, while Viktor's special 'spiral helicoid' copper pipe directed the water flow in an involuting flow movement away from the walls, giving the greatest reduction in friction, to zero or perhaps even below (negative friction or acceleration) at specific velocities.²²

Because of expectations of his peers, Popel's report played down the significance of the experiment, which in fact in these circumstances disproved the relevance of the Second Law of Thermodynamics, which states that energy in any closed systems must degenerate or run down. The implication of this was that a system can in certain circumstances generate energy spontaneously, that

once the initial impetus has been received, no further energy input is required. In other words, energy is not a constant. In this case it was increased through the emergence of fifth or sixth dimensional dynagens (see Chapter 2) created by what Schauberger called 'original' or 'cosmic' movement. Popel did, however, admit that in Schauberger's special pipe, friction at two specific velocities appeared to reduce to zero.

The circulation of blood

It is a common experience for those who use the ancient practice of watching the breath when they meditate, of the strange sensation of 'being breathed;' that the process seems to be part of a 'greater breathing.' Viktor Schauberger would often insist in a similar vein, that a bird 'is flown and a fish 'is swum.' On many occasions he said that the heart is not a pump, that it 'is pumped.' He saw the heart, rather, as a regulator or of blood flow. The spurts of blood that the heart produces during contraction are more like the automatic reaction to having been full, like the outbreath of the lungs.

The Stuttgart experiment had established that when the water flow was in resonance with the configuration of the pipe, there was no friction. Similarly the blood being in resonance with the arteries and capillaries greatly facilitates flow. In addition the blood vessels have a natural pulsating, peristaltic action. About 1927, Professor Kurt Bergel of Berlin University recorded this automatic pulsation a few days after incubation in small warm blood vessels around the egg sac of a bird's egg, although no heart had yet been formed. Professor Bergel also rejected the popular theory of the heart as a pump, insisting that this function was carried out by 'the millions of highly active capillaries permeating the body,' and that 'health and disease are primarily dependent on the faultless or disturbed activity of the capillaries.'²³

It appears that the pulsation of the capillaries initiate the circulation of the blood, augmented by the configuration of the blood vessels themselves.²⁴ The specifications for these would have been created with the original energy blueprint for hot-blooded creatures in general, and the human being in particular (see Chapter 2). Included in these specifications was even a provision that the viscosity of the blood would be reduced in the finer blood vessels, so

that its ability to flow freely would not be compromised! The same is found with sap at the tree's extremities.

A parallel may also be drawn between the veins and arteries twisting sinuously through the body, bringing nutrients to the tissues and organs and the streams and rivers, pulsating with eddies and spirals, winding their way through the countryside, nourishing the surrounding areas.

Temperature gradients also can influence the efficient circulation of blood. A strong positive gradient (where temperature decreases with movement in a given direction) between the inner core of the body and its outer extremities will stimulate the outward flow. This explains the invigoration of a cold shower. Conversely, a prolonged soak in a hot bath slows down the circulation, producing lethargy. The second is the result of the difference in the physico-chemical composition and therefore the energetic characteristics of arterial and venal blood.

Pulsation is assisted by the different electromagnetic charges carried by two principal types of blood. The positively-charged oxygen in the outward flowing arterial blood is gradually absorbed by muscles and skin, creating a partial vacuum. The negatively-charged, carbene-rich venal blood on the other hand returning from the extremities is ready to reabsorb oxygen from the lungs. The contraction of the heart muscle is a balancing response to opposite charges carried by the two types of blood in the relatively large heart chambers. It might also be said that the heart's pulsation is caused by our breathing in positively charged oxygen, (we then expel the negatively charged CO₂ and water), rather than the conventional belief that we breathe because the heart 'pumps.' The heart's real function is to stimulate pulsation in the blood flow.

The situation of the unborn child is different, for there is no temperature difference between the inner core and the outer extremities. It is likely therefore in the case of the foetus that the heart acts like a pump until it is born. After birth the heart would then assume its normal role as pulsator and balancer.

Callum Coats quotes research that calculates the total length of blood vessels in the average human adult to be about 96,500 km (60,000 miles)! On the basis of conventional hydraulic calculation it is inconceivable that the actual power output of the heart, about 1.5 watts, would be sufficient for this huge task.²⁵ Yet it does so.

12. SUPPLYING WATER

Moreover, Walter Schauberger calculated that the annual output of the heart would suffice to raise a weight of about 40 tonnes (44 tons) to a height of 1m (3.28ft).

The Stuttgart experiments showed that a specific configuration is required for frictionless flow to occur. Schauberger maintained that energy creates the vessel most conducive to its desired form of movement in a given situation; and that energy will always try to move frictionlessly in healthy, animate, organic systems. Seen in this light, the pulsating, almost frictionless flow of blood over these enormous distances becomes more comprehensible. It is important that further investigations should be pursued into the lines of research that Viktor Schauberger pioneered.

Water storage

With good water becoming increasingly more scarce, it is important to understand how to preserve its quality. Water's enemy is excess heat and light. Water contains oxygen, a substance that is essential for the processes of growth and decay. Below a temperature of 9°C (48°F), oxygen is used for growth, above that, to promote decomposition. As the temperature rises above 10°C (50°F), the oxygen becomes increasingly more aggressive, promoting pathogenic bacteria which can give us disease when we drink the water containing them.

A tank or cistern that is above ground needs to be well insulated, and painted white to reflect the Sun's heat. If it is mostly below ground, the walls will not require insulation, but the top must be painted white. However, Viktor Schauberger urged us to observe the shapes that Nature uses to propagate and maintain life. Nature abhors squares (cubes), rectangles (water tanks) and circles (cylinders). He said that we should not be surprised that our dependence on these unnatural shapes for storage results in the deterioration of our water. This is probably impractical for larger containers, but we should try a more natural shape for smaller containers.

Because it is a living organism, water needs to be in constant movement to maintain its health. The only container that allows this is the egg-shape. The material of containment is very important, because water needs to keep cool; the best materials are natural stone, wood or terracotta. The ancient Greeks understood this, and